





Extract from the
SECOND REPORT

OF A

GEOLOGICAL RECONNOISSANCE

OF THE

MIDDLE AND SOUTHERN COUNTIES

OF

A R K A N S A S.

MADE DURING THE YEARS 1859 AND 1860.

BY

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ASSISTED BY

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BOTANICAL AND PALEONTOLOGICAL REPORT

ON THE

GEOLOGICAL STATE SURVEY

OF

ARKANSAS.

BY

LEO LESQUEREUX.

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TO DR. D. DALE OWEN,

Director of the State Geological Survey of Arkansas.

DEAR SIR: In presenting to you my Report on the Geological State Survey of Arkansas, allow me briefly to review the instructions which I received from you, concerning the researches I had to pursue, as the Botanist and Botanical Palæontologist of the Survey.

In Fossil Botany, I was directed, 1st, to examine the plants of the coal and associated strata, with a view to finding, if possible, evidence of the age, number, and distribution of the coal-beds of Arkansas.

2d. To examine, for the same purpose, the fossil remains of plants accompanying the lignite formation, and to determine the age of these strata, either quaternary, tertiary, or cretaceous.

3d. To make a comparison between the Fossil Flora of the true Coal-Measures of the Millstone Grit or Subconglomeratic Coals, and of the more recent lignites.

Concerning recent Botany, the directions were :

1st. To examine the general distribution of the natural families of living plants of Arkansas, and mark the species peculiar to certain localities, especially and carefully studying and enumerating the plants inhabiting the Mammoth Spring of Fulton County, and those found around and within the Hot Springs.

2d. To investigate the geological distribution of the plants, or to mark the plants which characterize certain geological horizons.

3d. To examine the agricultural peculiarities of each botanical zone, and to give a popular description of the most useful species of plants in agriculture, medicine, &c.

4th. To make a list or catalogue of the plants of Arkansas, as far as time and opportunity might permit.

During the short time allowed me for exploration, I have endeavored to follow these instructions to the best of my ability. In company with Prof. E. T. Cox, a friend to whom I am already under many obligations for kind and valuable assistance, I entered Arkansas, with Camp No. 2, near the Mammoth Spring of Fulton County, on the 15th of October. The lateness of the season, and the consequent hurry of our explorations, did not permit me as long and favorable a study of the living botany of Arkansas as I should have liked. This has unavoidably caused some deficiency in that part of my report treating of the distribution of living plants in Arkansas. But I have endeavored to complete in a manner the catalogue of plants, by enumerating, along with the species observed by members of the Survey and by myself, those which I have found mentioned by former botanical explorers in Arkansas.

Very respectfully yours,

LEO LESQUEREUX.

INTRODUCTORY REMARKS.

THE progress of the civilization of a people or of a country is marked by the development of its industry. In this century, the active power of industry is steam. Man is no more a machine—an instrument. His mind has subdued matter, has moulded it into the most complicated and diversified forms, has truly animated it, giving it power, strength—indeed life, by the wonderful application of steam. The true generator of steam is coal. Thus, a country is more likely to take the lead in industrial development, and therefore in civilization, if it be provided with a large amount of this combustible mineral. No political economist now would dare to estimate the present or future riches of a people, and their resources, without taking for a basis of his calculations its facilities for procuring a supply of coal. Even some of the most celebrated geographers and philosophers of our time have asserted that the Continent of North America, and especially the great valley of the Mississippi, would, at a future day, become inhabited by the densest and most civilized population of the world, because it has, in its extensive coal-fields, the largest amount of coal, that originator of industrial life.

Everybody is now acquainted with the general distribution and extent of the great coal-basins east of the Mississippi river. The great Appalachian basin occupies part of Pennsylvania, Ohio, Virginia, and Kentucky; its western limits being marked by a line running nearly due southward, passing near the mouth of the Scioto river, in Ohio. The Illinois coal-fields cover parts of Indiana, of Western Kentucky, of Illinois, throwing out spurs into Missouri, Arkansas, and farther west. The more the spurs are removed from the centre of the coal-basin, or from its most productive part, the more the coal which they contain becomes valuable, from the scarcity of the combustible mineral. This shows the great value of the coal strata of Western Arkansas, and the advantage that would result to the State from an extensive and rich coal-deposit. Not only the navigation of the Arkansas river would, at a future time, depend upon it; but it would supply with combustible material the inhabitants of the western

prairies, and direct the future construction of railroads, which are generally attracted by the coal, as by a powerful magnet.

It was, therefore, with a due consideration to the interests of the State that the Governor of Arkansas, and the State Geologist of the Survey, ordered that researches should be made to reconnoitre carefully the extent of the coal-basin of Arkansas, and its capacity, or the number of coal-strata which it contains in the whole thickness of the measures.

The coal-measures of the United States, at least in the places where they have received their full development, appear divided into four members by three different and thick strata of sandstone. The upper member rests upon a stratum named, in the Reports of the Kentucky Geological Survey, the *Anvil-Rock* sandstone, and contains some coal-beds, which are apparently extended over a wide area, but which until now have not been found of workable thickness. The second member in descending order is underlaid by the Mahoning sandstone, another great sandstone, sometimes conglomeratic in its upper part. This member, four to five hundred feet in thickness, contains, especially in Pennsylvania, the great Pittsburg coal-bed, and in Kentucky as many as five workable beds of coal, one of which, corresponding, by its position, with the Pittsburg coal, is generally from four to five feet thick. The third member, of about the same thickness as the former, lies between the Mahoning sandstone and the Millstone Grit series, or Conglomerate Formation, and contains also from four to six workable strata of coal, one of which is generally from four to six feet thick. This Millstone Grit, a variable formation, considering either the thickness or the nature of its strata, has been considered as the base of the true coal-measures, and the coal-bearing strata underlying it have been named by some geologists *the False Coal-measures*. But the examination of these strata, and the comparison of the fossil plants found in connection with them, tend to prove that this fourth member which descends from the base of the Millstone Grit to the Subcarboniferous Limestone, cannot be separated from the whole of our coal-formations; that it is a *true* member of them; that in some countries it contains two or three workable beds of coal, which can be as profitably worked as any bed of the other members.

As has been reported in the first volume of the Geological State Survey of Arkansas, all the coal-beds of the State appear to belong to the lowest member of the coal-formations, underlying the Millstone Grit. At least, all the hills or mountains at the base of which coal-strata have been found in Arkansas, are formed of shales and of various kinds of sandstone, all belonging to the Conglomerate Series, which reach here a great thickness. Even at the top of the highest mountains, I have failed to discover a trace of the coal or of the other measures which follow the Millstone Grit in ascending order. This cannot lead to the conclusion that the prospect for

good workable beds of coal is not encouraging in Arkansas. Near the western limits of the coal-basin, the Millstone Grit and the underlying strata take apparently a great development, and thus coal may be found there, at least one bed of it, as thick as in the higher series of the formation. Moreover, the extraordinary horizontality of the geological measures in Western Arkansas, causes an extensive distribution of the strata containing the coal, either near the surface or at a depth where the combustible material may be easily reached. Coal has already been found and surveyed in twelve counties, and just in those that are farthest from the great coal-basin which extends east of the Mississippi. The combustible mineral, thus rendered more valuable, becomes still more so from the situation of the coal-basin along the Arkansas river, and on both sides of it. Washington, Crawford, Sebastian, Franklin, Scott, Johnson, Yell, Pope, Perry, Conway, White, and Pulaski Counties are all of them almost entirely situated in the coal-basin of Arkansas, and its productive strata may yet be extended into some of the adjacent counties.

WASHINGTON COUNTY COAL, AT FAYETTEVILLE.

My examination of this place was directed first to a thick bed of black shales, exposed about twelve feet thick, below Cato's springs. These shales were supposed to belong to the true coal-measures, and to contain a bed of coal, which might be found by boring at some depth. They are of a coarse texture, somewhat micaceous, and do not show any trace of fossil plants. Their horizontal surface is only marked by ripples, evidently caused by the movement of the water at the time of their formation, and by long, irregular, depressed, and transversely wrinkled lines, half an inch broad, which are prints left by the progress of worms, or, rather, of small crustaceæ. These peculiar marks are found in great abundance in the upper beds of the Old Red Sandstone of Pennsylvania. Thus, by analogy of the palæontological remains, these shales are referred to the Subcarboniferous strata of the West, which, in part, take the place of the Old Red Sandstone of the East.

On the western side of the town of Fayetteville, and at a higher geological level than the black shales of Cato's springs, there are two outcrops of coal, which indicate, by their dirt, thin and scarcely valuable beds. None of these coal-beds have been opened. The lowest, just under a stratum of limestone, and said to be one foot thick, could not be examined. The other immediately overlying the same limestone, from which it is separated by a bed of fireclay, is supposed to be of the same thickness although its outcrop does not show more than one or two inches of coal. It is overlaid by a thick stratum of soft, grayish, or yellow shales ("soap-

stone'), which do not apparently contain any other fossil plants but some leaves of *Lepidodendron*, resembling long blades of grass.

Though the examination of these coal-beds was unsatisfactory, since they were not opened and exposed to view, I have no doubt that the upper one overlaid by "soapstone" is the first coal below the Millstone Grit, generally the only one developed at this geological station. It is ordinarily overlaid by soft yellow shales, containing pebbles of carbonate of iron or clay iron ore, and marked by remains of fossil plants, of which the most common species, and often the only one present, is *Lepidophyllum*; that is, those leaves of *Lepidodendron* mentioned above.

The shales of this coal are remarkably variable, either in their color, or hardness of texture, according to the amount of bitumen or of iron deposited while in the process of formation. On banks where they are exposed at some length, one can see them insensibly passing from a yellow soft soapstone mixed with clay iron ore to hard black shales, generally more or less abundantly intermingled with pebbles of carbonate of iron, which have mostly the form and the size of hen's-eggs. Sometimes these shales are so thoroughly penetrated by oxide of iron, that they constitute a hard and valuable iron ore. It is necessary to observe these changes in the appearance of the shales of the subconglomeratic coal-beds in order to account for the difference which may be found at various localities.

The beds of coal at Fayetteville, though thin at the place where they crop out, may be found in close proximity to it, have a thickness of two feet, or perhaps more. But it would be useless, I think, to search anywhere in Arkansas for a bed of coal below the Archimedes Limestone, which is exposed at the base of the hills near the town. And as the Millstone Grit formation does not, apparently at least, contain any limestone, the presence of a stratum of this nature may at once be accepted as an indication that coal in Arkansas cannot be found at a lower level.

MALE'S COAL-BANK. HIGHER WATERS OF MIDDLE FORK OF WHITE RIVER.

Ascending from Fayetteville to the top of the hills, on the higher waters of the middle fork of White river, near Mr. Hubbert's farm, a very interesting section is exposed from the base of the Subcarboniferous measures to the upper part of the Millstone Grit series.* There, about one hundred feet below the strata which mark the base of the Millstone Grit, and from which it is separated by two beds of Subcarboniferous Limestone with intervening blue shales, shaly sandstone and chert, there is a thick stratum of coarse sandstone containing plants of the true coal epoch, viz., species

* See Mr. E. T. Cox's Report, hereafter.

of *Stigmaria*, *Calamites*, *Sigillaria*, &c. It is probably from an equivalent geological horizon that a great number of beautiful plants of the same epoch have been obtained by the State Geological Survey of Illinois, in a bed of sandstone underlying the first upper Archimedes Limestone; an interesting fact, showing the beginning of the vegetation of the coal at a time when the plants had not been heaped up for the formation of the combustible matter, and exhibiting at the outset species bearing no relation to those of inferior strata, or to those of the Old Red Sandstone.

The coal-bank at Mr. Male's is only eight to ten inches thick; but apparently of excellent quality. It is generally overlaid by a bed of gray, hard, somewhat micaceous soft shales, which contain, besides the leaves of *Lepidodendron*, a great quantity of beautifully preserved remains of plants.* As the coal-bank where we examined it, was worked by stripping the surface, a trench of some length had been opened through the strata overlying it, and had exposed one of those curious changes to which I have alluded above. At one extremity of the trench, the shales, two feet thick, have their normal appearance; they are gray, soft, or black, and bituminous near their contact with the coal. At the other extremity, and by short transitions, they have passed into a kind of ferruginous limestone, or rather conglomeratic iron ore, which is the base of the Conglomerate series overlying this coal. The same stratigraphical distribution, and even the same changes in the nature of the shales, have been reported for the Geological State Survey of Kentucky; at the coal-bank of McCormie, near the western limits of Morgan County, where the Subconglomerate coal, sixteen to twenty feet thick, is, at one place, overlaid by soapstone; at another by black hard ferruginous shales, and at a third opening, immediately by conglomerate, the shales disappearing totally.

About one mile from Mr. Male's coal-bank, another opening (Gallion's bank) has been made in the same bed. The thickness of the coal is the same. Time did not permit us to visit it.

WOTON'S COAL-BANK. HEAD WATERS OF LEE CREEK.

Section 34, Township 13, Range 31.

The coal, ten inches thick, is here also placed at, or very near the base of the Millstone Grit series, being only separated from it by the overlying shales, and being separated from the upper Archimedes Limestone by twenty-three feet of sandstone and fireclay. At two openings of this coal the shales that cover it are still very different in appearance. At one

* The enumeration of these plants is given in the Table, further on.

place, the coal is overlaid by seven to eight feet of grayish-yellow, soft, very brittle shales, full of remains of plants. At the top of the shales appears another bed of coal a few inches thick. Near by, the shales overlying the coal are fifty to sixty feet thick, and black, micaceous, with very few prints of plants, if any. The second bed of coal is not formed at this last opening. Down the creek, the shales become in places yellow, hard, and half transformed into carbonate of iron and clay ironstones. This conformation is still in accordance with what has been reported of the Sub-conglomerate coal of Morgan County, Kentucky, where Well's coal-bank, twenty-two inches thick, is separated from another thin bed of coal, five to six inches thick, by sixteen feet of black shales. This leads us to remark that as, occasionally, the shales covering the coal are not present, and the coal is immediately covered by the conglomerate, so in like manner, when two beds of coal have been formed, the intermediate shales may thin in such a way that both coal-beds become united in one, being only separated by a clay parting.

In descending Lee creek and entering Crawford county, ten and a half miles below Woton's coal-bank, we found in the creek large pieces of sandstone covered with *Fucoides cauda-galli*, a kind of fossil plant said to be peculiar to the Chemung group, or Upper Devonian. As the general dip in that part of the country is to the southwest, or in the same direction which we were following, the presence of this Devonian species appears here an anomaly, and can only be explained by some peculiar disturbance of the strata, or rather by the supposition that this species has a much wider range of distribution than had till now been supposed. In some places, along the margins of the eastern coal-basin of Kentucky, the Conglomerate is sometimes immediately underlaid by this formation of the *Fucoides cauda-galli*.

CRAWFORD COUNTY. MR. PHILIP'S COAL-BANK, NEAR FROG BAYOU.

Except the nomenclature of the fossil plants found in connection with this coal there is scarcely anything to add to the exact description given of it by Professor E. T. Cox, page 226 of the first Report. The shales overlying the coal are about twenty feet thick, and generally black or grayish-blue, hard, micaceous, very bituminous in their approach to the coal, where they only contain remains of fossil plants. From top to bottom they are intermixed with pebbles of carbonate of iron in abundance. The vegetable remains of these shales are mostly those of *Cordaites borasifolia* (Ung.), a plant which covers, or apparently constitutes the shales for about two feet of their thickness. The leaves of the species, which were long and ribbon-like, filled alone great spaces of the marshes of the coal

formations, just as the water-lily or the spatterdock does the swamps of our time. The relation of this plant is still uncertain. Some of the numerous and large fruit, found in the shales of the coal, have been referred to this species, apparently without reason; for the shales which have preserved the greatest quantity of these leaves contain scarcely any remains of fruits.

SEBASTIAN COUNTY, JENNY LIND PRAIRIE. MR. GREEN'S COAL-BANK.

From the strata of red ferruginous or ochreous clay shale, which generally mark the base of the Millstone Grit series in Arkansas, and which crop out at the base of the hills bordering the prairies, the position of this coal, as Subconglomeratic, becomes at once evident. As the shales of this coal do not show the same general appearance as at the other localities where it was examined, this stratigraphical conclusion is of some value. The shales look like a compound of yellow clay and ironstones mixed together. They break crosswise or perpendicularly rather than horizontally, and are separated by irregular bands or thin veins of clay more deeply colored with oxide of iron and extremely brittle. The fossil plants contained in this peculiar kind of shale are tolerably numerous, but they are generally broken and difficult to determine. The species which would be recognized, and which are enumerated in the table, strengthen the conclusion which places this coal at the same geological horizon with those above. The coal, here, is four and a half feet thick, and has two clay partings of about one inch each. But the top coal, for about one foot of its thickness, is a shaly or brashy coal of little value as a combustible. It looks like a brittle black shale intermixed with lamellæ of coal-matter and full of broken remains of plants difficult to determine. The presence of this brash coal is still a character which in some places may help the identification of the Subconglomeratic coal. In Indiana, the whole thickness of the bed corresponding to this one by its position, is at times only a compound of brash or black bituminous thin layers of shale, separated by alternate thin layers of coal. In Kentucky, the Subconglomerate coal bed is generally, if not always, overlaid by a few inches of this kind of brash, which has to be separated from the true coal as useless.

JAMES' FORK OF POTEAU. MR. MORROW'S COAL-BANK.

At this place, there is not any difference in the appearance and the nature of the shale from what we described at Frog Bayou or at Male's coal-bank. The shales are gray, hard, somewhat micaceous, intermingled

with pebbles of carbonate of iron, and marked by a few fossil plants. The coal, three and a half feet thick, is like that of Jenny Lind prairie, overlaid by half a foot of brash, which contains a great abundance of fossil plants. They have been determined, and are enumerated in the Table. The species indicate the closest relation with those of Mr. Male's coal-bank. Thus, this coal of James' Fork, by the nature and composition of the shales, and by its brash coal, and by the identity of the plants which it contains, is like an intermediate link uniting all the coal-banks examined until now, or indicating their place on the same geological horizon. It has a number of the plants of Male's coal, especially the two species which I consider true characteristic plants of the Subconglomeratic coal in Arkansas, viz., *Alethopteris Owenii*, Sp. nov., and *Sphenophyllum bifurcatum*, Sp. nov., the first common also at Lee's Creek coal-bank. It has the shales of the same composition and appearance as those examined at Frog Bayou, as also the same plants, and the brash coal and the fossil species of Jenny Lind prairie coal.

The thickness of the two coal-banks examined in Sebastian County, compared with that of the coal strata of Crawford and Washington Counties, would perhaps indicate a progressive increase in the development of the subconglomeratic coal towards the south. Hence, the researches for workable beds of coal might be advantageously followed up, not only in Sebastian County but also in the southern part of Franklin and Johnson and in the northern part of Scott and Yell Counties.

FRANKLIN COUNTY, GRAND PRAIRIE. JUDGE ALDRICH'S COAL-BANK.

This bank has been worked occasionally to supply the wants of the blacksmiths of the country. It is still opened at some other localities in the neighborhood, and found nearly everywhere in the prairies of South Franklin, one or two feet below the surface. But where we had an opportunity of examining it, the coal had been covered up again, and nothing could be seen of it but a few pieces of shale thrown out from old ditches. This coal on Grand Prairie is generally eighteen inches thick, overlaid by hard, sandy, micaceous gray shales. The only fossil plant found in connection with them is *Calamites pachyderma*, Brgt., a species which, till now, has never been found but within or below the Conglomerate Series. Thus, though the examination of this coal was necessarily unsatisfactory from the want of exposed materials, the finding of this only species is sufficient to indicate its position as being below the Millstone Grit. Another evidence of the position of this coal was found in the nature of the strata overlying it; since just at the top of a small hill in the middle of Grand Prairie, and at about forty feet above an opening of this coal,

we found another coal-bed six inches thick, showing here the separation of the coal into two strata as it has been remarked at Lee Creek and Frog Bayou.

The composition of the black fire-clay underlying the Aldrich's coal, and the abundance of iron in the shales above it, indicate a contemporary formation of this bed with the others already mentioned. The hard fire-clay, blackened by roots of *Stigmara*, is remarkably developed under the Subconglomerate coal. It is sometimes found alone and without coal, in such places where the combustible matter has not been formed.

On Hurricane Creek, the same coal is opened at Mr. Newton Carpenter's, where it is of the same thickness.

JOHNSON COUNTY, HORSEHEAD CREEK, MORISSON'S, WILMOTH'S, BUTT'S, LEE'S,
AND OTHER COAL-BANKS.*

The general appearance of the shales of all these different coal-banks, which are evidently openings in the same coal-bed, are exactly the same as those of the coal of Frog Bayou and James' Fork. The only difference is, that sometimes the shales, as at Morisson's bank, become more bituminous, and insensibly pass to brash, near their contact with the coal. At Mr. Wilmoth's bank, where the shales are exposed in a thickness of about twenty feet, they are gray, micaceous, intermingled with pebbles of carbonate of iron, generally ferruginous, and with few remains of plants. The coal here, twenty inches thick (the same thickness as at the other openings of Horsehead Creek) is better than at Mr. Morisson's bank, where it lies nearer to the surface, and is consequently somewhat rusted and broken by percolation of water charged with oxide of iron. Among the few fossil plants found in the shales are some broken *Lepidodendron*, especially their leaves; *Neuropteris tenuifolia*, which was seen at every coal-bank examined in Arkansas, and *Cordaites flabelliformis*, Ung.

On reviewing with Mr. Cox his section (published page 231 of his first Report), and ascending to the highest point of Horsehead Creek Mountain, we found, by barometrical measurement (1150) eleven hundred and fifty feet of measures of the Millstone Grit series overlying this coal. The base of the series is here, as elsewhere in Arkansas, a compound of reddish and sometimes dark brown argillaceous shales, and the top a conglomerate sandstone. The hard, coarse sandstone covered with vermicular concretions (a peculiar kind of impressions, which have been mentioned in the first Report, page 114) is in place near the top of the Horsehead Creek Mountain. I had thus a good opportunity of examining these curious

* See description of these coal-banks in Mr. Cox's first Report, page 231.

marks, which generally look like large worms of sandstone, incrusting in a matrix of the same matter. But I was unable to discover in them any trace of organism, or any general typical form to which they could be referred. Their outline is very irregular; sometimes they appear long, linear, of equal thickness (generally half an inch) in their whole length; sometimes they are constricted, and apparently cut into pieces of unequal size; sometimes they are thicker, short, and even perfectly round. I suppose that they are pure mechanical concretions, formed by infiltration or percolation of water, charged with carbonate of lime or oxide of iron at the time when the sandstone was yet a soft sandbank. The extraordinary horizontal extent of the sandstone bearing these marks is nevertheless a fact apparently contradictory to this explanation; for it appears near the top of all the conglomerate hills of the coal-measures of Arkansas, when they are high enough to reach its geological horizon. But the nature of the overlying strata might have influenced the infiltration of foreign substances over a vast area.*

MOUTH OF SPADRA CREEK. SPADRA COAL.†

The shales covering this coal bear already, like those of the Horsehead Creek coal-bed, traces of a metamorphism which has hardened them and split them contrary to the plan of stratification. This renders them brittle, and causes under the stroke of the hammer irregular fractures which prevent the preservation of fossil plants. The shales are grayish or black, less micaceous than at Horsehead Creek, and more like those of Male's coal-bank. The few plants determinable in the broken pieces of shale are, *Neuropteris tenuifolia*, Brgt.; an abundance of leaves of *Lepidodendron* and *Lepidophyllum lanceolatum*, Brgt. The coal is overlaid by the same brash coal as that of James' Fork and other places, which contains especially in abundance *Calamites undulatus*, Brgt., and *Calamites pachyderma*, Brgt. These species, like the former, show the same geological horizon for this coal as for the other beds examined in Arkansas. At some places, near the mouth of Spadra Creek, the coal is three and a half feet thick, including a clay parting of three inches, and about six inches of brashy coal. It is still underlaid by the black, hard fire-clay full of leaves of *Stigmaria* which has been mentioned before. The same coal crops out above the town of Spadra, on the bank of the Arkansas River, where it is

* To give an idea of the difficulties attending a botanical exploration at this season of the year, I may mention that, on the 12th of November we ascended the mountain with a strong, cold north wind and snow.

† See description of this coal by the State Geologist, in the first volume of the Report, page 129.

said to be four feet thick. It is thus probable that the same coal will be found of workable thickness all around the country, when the combustible mineral shall become valuable enough to encourage exploration by borings. Clarksville, the county seat of Johnson, is built on an eminence, just at the top of the black shales overlying the Spadra coal. These shales may attain a thickness of fifty to sixty feet; but, as near the town the bank of shales is cut by the creek to the depth of thirty to forty feet, the coal, if it is formed there, would probably be found ten to twenty feet below the level of the creek.

The coal-bank of Dwight mission, in the same county, is the only one that was still in the way of our route, and the last which I was directed to examine. At our passage there it was covered by high water and could not be seen. But the great bank of shales exposed near the river, of a thickness of about sixty feet, shows, in its composition, the same materials which have been seen before. The shales have apparently the same composition, and contain in extraordinary quantity pebbles of carbonate of iron.

As a conclusion to this examination of some of the coal-banks of Arkansas it may be remarked:

That the value of the coal-beds of a country is necessarily relative, and cannot be estimated by comparison with the price or the value of the coal at another place. A bed of anthracite three feet thick is profitably worked, even by a shaft fifty to one hundred feet deep, in the basins of Pennsylvania, where numerous strata of the same combustible mineral are found and worked from six to nine feet thick, or more, and where millions of tons are every year mined and brought to market. A bed of bituminous coal four feet thick is remunerative when worked all along the Ohio river from Pittsburg to Careyville, although, from an excessive competition, the coal is sometimes delivered to the boats at five cents per bushel, or even lower. In Arkansas, where the coal is semi-bituminous, or half anthracite, and consequently of higher value as a heating agent than the bituminous coal of the East; where also this combustible material, though still uncalled for by manufacturers, and used only for a few forges, is paid at the bank from ten to twenty-five cents per bushel, the coal has a much higher value. From data collected in statistical tables it results that a coal-bank like the Spadra's, three and a half feet thick, producing about three feet of clean coal, will hereafter, and when the demand for coal becomes more pressing, give to the owners more profitable results than a bank of nine feet of anthracite would give in the central part of the basin of Pennsylvania.

It is true that in Arkansas the working of the coal will never excite such speculation and employ such a capital as is necessary in or near the centre of the coal-basin. But from what is known already about the dis-

tribution of the subconglomerate coal in Arkansas, one has the right to assert that by and by coal will be found if not in very thick strata, at least abundantly enough to supply the wants of the future manufacturing establishments of the country.

To direct future researches it will be well to remember that the coal strata of Arkansas generally underlie, at a distance of fifty to one hundred feet, a bed of red ferruginous clay or red earth which is easily distinguished wherever it appears in the counties mentioned as included in the area of the coal-fields of Arkansas. It is also well to bear in mind that, although two beds of coal may have been formed in Arkansas, it is the lowest only which, up to the present time, has been found of workable thickness. The Subcarboniferous measures generally underlie it at a short distance, and no coal can be expected to be found within them.

DESCRIPTION OF NEW SPECIES OF FOSSIL PLANTS COLLECTED IN THE SHALES
OVERLYING THE SUBCONGLOMERATE COAL OF ARKANSAS.

Two considerations favor a careful description of the fossil-flora of the coal of Arkansas :

1st. The practical utility of palæontology in its application to the identification of coal or any other geological strata.

2d. The peculiar position of the coal of Arkansas, so well developed at a geological horizon where until now the formation of a good workable bed of coal has been considered as problematical. It is evident that the ascertaining of the true place of this coal may direct researches for combustible mineral at a lower level than where they have been pursued till now in other States. Moreover, the scientific world at large is at present very much interested in trying to solve the question of the distribution of vegetation in the different geological strata of our globe, and to find links of union which may exist between species and genera successively appearing in various strata. It is worth while, therefore, to carefully collect and record all the data which may afford reliable indication to the limits of the flora of the true coal period.

The following short description of the new species of fossil plants found in connection with the shales overlying the coal of Arkansas is given without following the natural and botanical order, but only as an explanation of the figures of the plates. This report is not the place for long scientific discussions and for close and comparative descriptions. They would be useless to the reader who is not acquainted with fossil plants, and to the botanist they would reveal nothing new. For the same reason I omit describing the species already known which are common to the Subconglomerate coal and to the coal above the Millstone Grit.





Fig. 1.

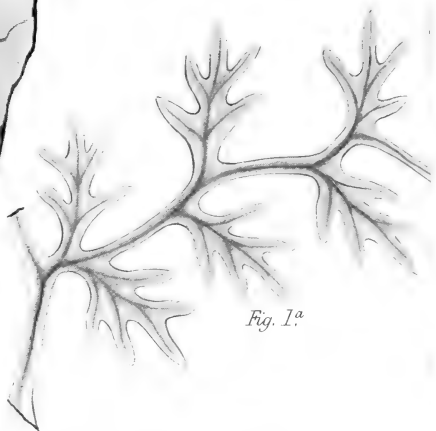


Fig. 1^a.

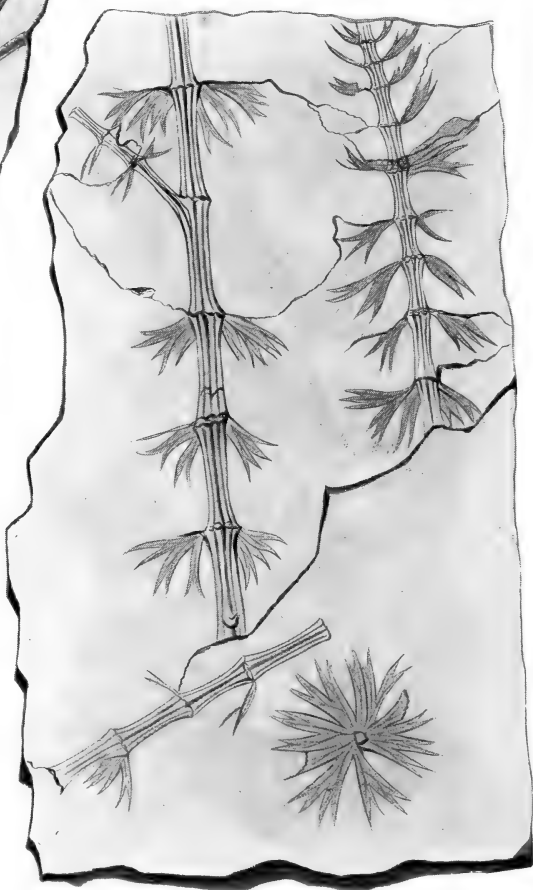


Fig. 2.

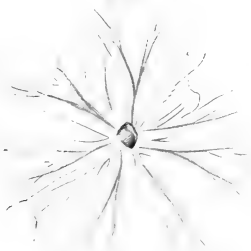


Fig. 2^a.

Lea Lesquereux del.

Dougal sc.

Fig. 1. & 1^a *Hymenophyllites flexicaulis*, Sp. nov.
 Fig. 2. & 2^a *Sphenophyllum bifurcatum*, Sp. nov.

These are enumerated in the table with a mention of the place where they have been found.

1. *Hymenophyllites flexicaulis*, Sp. nov. (Pl. 1, fig. 1 and 1 a). Frond much branched, four to five times pinnately divided. Divisions alternate. Primary and secondary rachis broad, flattened on the margins, inflated in the middle, somewhat regularly bent at each ramification. Branchlets exactly flexuose, bending in a zigzag way from the point of attachment of each leaflet, which thus appear as a continuation of the rachis. Leaflets oval-lanceolate in outline, small, scarcely an eighth of an inch long, palmately divided in three or four or pinnately in five lobes. Divisions linear-lanceolate obtuse, marked by a single medial nerve, decurrent in the branchlet. Fig. 1 a is an enlarged leaf of this fern which, though somewhat related to *Sphenopteris flexuosa*, Gutb., an European species, differs from it by well-marked characters. It abounds in the shales of Mr. Male's coal-bank on the Middle Fork of White River, Washington County.

2. *Sphenophyllum bifurcatum*, Sp. nov. (Tab. 1, fig. 2 and 2 a). Stem thick, branching, inflated at the articulations, deeply furrowed, smooth. Leaves in whorls of nine or ten cuneiform, or flabellate leaflets, narrowed near the base, dilated above, regularly divided two times. Primary divisions deeper; secondary ones lanceolate acute, diverging, each marked by a strong medial nerve ascending to the point. This species is distantly related to *Sphenophyllum dichotomum*, Germ. & Kaulf, and to *Sphenophyllum oblongifolium*, Germ. Though fragments of the different parts of the plant were found the form of the leaves does not show any variation. Fig. 2 a shows a whorl of leaves, enlarged two times. The leaflets appear united at the base but it may be an appearance of the stone. *Sphenophyllum trifoliatum* Lsqx., of the Pennsylvania State Geological Report, p. 853, tab. 1, fig. 7, may be referred to this species. Found in the shales of Male's coal and of James' Fork of Poteau.

3. *Alethopteris Owenii*, Sp. nov. (Pl. 2, fig. 1 and 1 a). Frond large, bi- or tripinnate. Rachis or stem broad, thick, nodose, striate. Secondary divisions or pinnæ perpendicular to the stem; pinnules ovate-lanceolate or lanceolate in some parts of the frond, generally obtuse, sometimes pointed, with undulate margins united near the base and perpendicular on the rachis. Medial nerve well marked, but generally thin, sometimes deep; nervules forking twice. This fine species, dedicated to Dr. D. Dale Owen, the celebrated geologist, director of the survey of Arkansas, abounds at Male's and also at Lee-creek coal, but was found only in broken pieces. It differs from *Alethopteris Coxiana*, Lsqx., its nearest relative, by narrower, less undulate or more entire leaflets, apparently thick and coriaceous, and by a general appearance total y different.

4. *Staphylopteris stellata*, Sp. nov. (Pl. 2, fig. 2, 2 a and 2 b). These remains apparently belong to the sporanges of a fern borne on a distinct

stem or pedicle. As it is shown in the figure, the spore-cases are oval or round, narrowly striated, united four or five together by short alternate branches perpendicular to the smooth main stem. Some branches appear longer than the point where the spores are attached, and thus may have been a common pedicle for a few groups of spores. Such fructifications of ferns, supported on a peculiar pedicle and distinct from the sterile leaves, are common enough in our time, but are very rarely found in the old formations. I do not know of another species found in the coal formations but this. The genus *Staphylopteris* was established by Mr. Brongnart on a species found in the tertiary.

5. *Sphenopteris dilatata*, Sp. nov. (Pl. 2, fig 3 and 3 a). Frond bi-pinnately divided. Pinnæ short, oval-lanceolate in outline; pinnules irregular, round or enlarged above and fan-shaped, decurring on the rachis, mostly united near the base. Medial nerve obsolete or none; nervules dichotome or forking two times, arched and oblique to the medial nerve. By its peculiar nervation, which is like that of a *Neuropteris*, this species would be referable to the genus *Adiantites*, Göpp. Male's coal-bank.

6. *Asterophyllites gracilis*, Sp. nov. (Pl. 2, fig. 4 and 4 a). Stem narrow, thread-like; leaves in whorls, narrow, linear, pointed and marked by a medial nerve; the point generally upraised. Though I have found a few specimens of this species, they present all the same form and appearance as shown in the figure. The leaves, never flattened, are imbedded in the stone in such a way that the horizontal section shows only their thickness and their direction. Probably the figure only represents a branch of a somewhat larger species. The hardness of the leaves indicated by the peculiar disposition of all the whorls, separate it from all the other species of the genus. Locality, Male's coal-bank.

7. *Lepidodendron modulatum*, Lsqx. (Pl. 3, fig. 1 and 1 a.) Stem apparently of a great size. Scars oval, narrowed and acuminate at both ends, separated by a broad, half round, elevated and deeply furrowed or wrinkled margin. Wrinkles undulated and mainly parallel to the scars. Vascular scars rhomboidal, arched or obtuse above, narrowed at the base in a long depressed point, acute at both sides, marked with three transverse points. Tubercles narrow; medial line deeply marked and transversely furrowed by deep short wrinkles. Surface of the scars transversely, narrowly wrinkled; appendage double. This beautiful species was first found in the low coal of Carbondale, Pennsylvania; but only in some pieces of a large stem figured at 1 a. The specimen fig. 1 of Male's coal shows the exact preservation of the specific characters on a branch or on a young tree, and consequently fixes the validity of the characters presented by the scars of the bark of the *Lepidodendron*.

8. *Sigillaria reticulata*, Sp. nov. (Pl. 3, fig. 2). Surface reticulated by perpendicular furrows and horizontal deep wrinkles. Scars distant, nearly as



Fig. 1.



Fig. 1^a



Fig. 2.



Fig. 4^a



Fig. 4^b



Fig. 2^b



Fig. 2^a



Fig. 3.

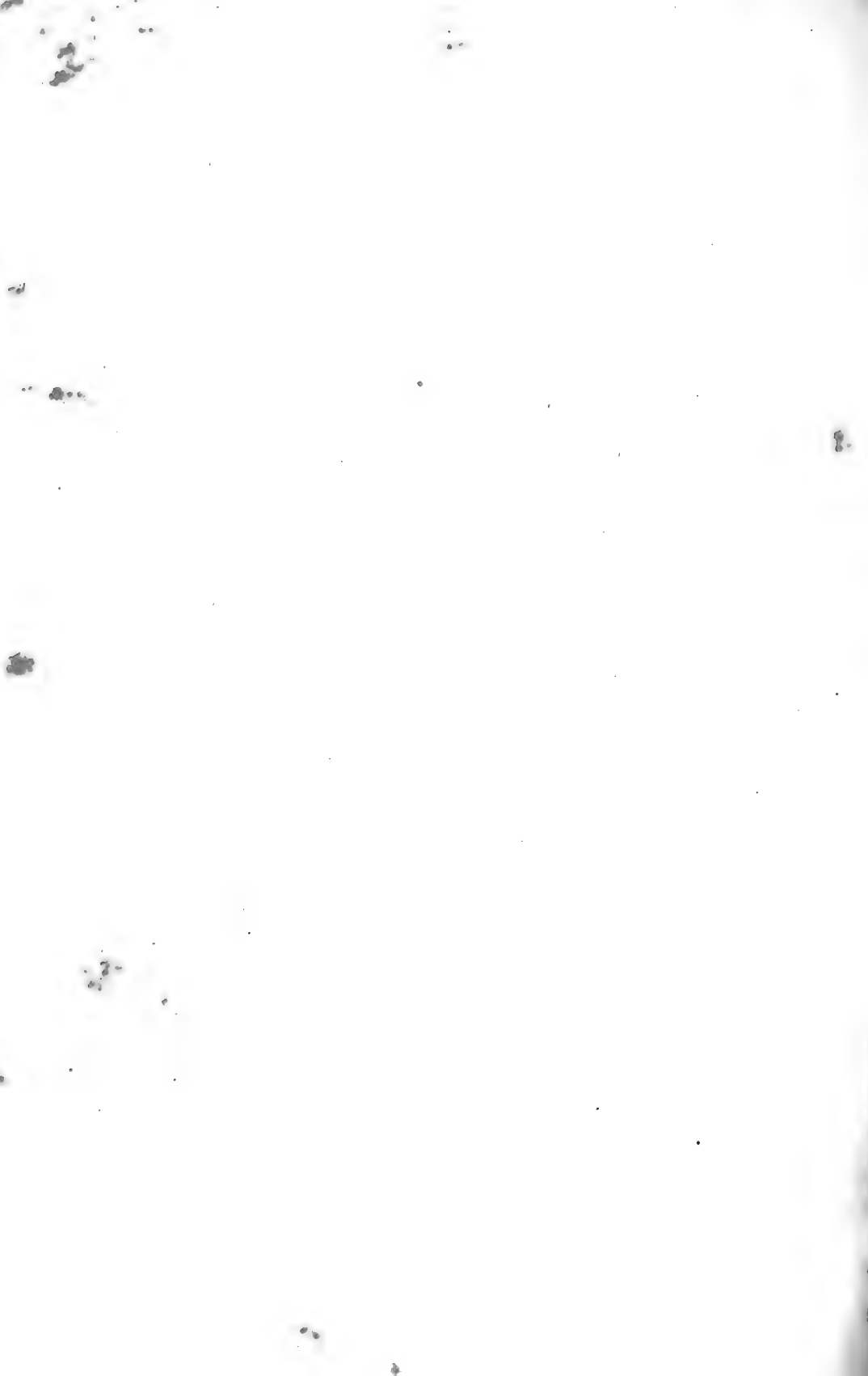


Fig. 3^a

Lec. Lesquereux del.

Douglas sc.

Fig. 1. *Alethopteris Owenii*, Sp. nov. Fig. 2. 2^a 2^b *Staphylopteris stellata*, Sp. nov. Fig. 3. & 3^a *Sphenopteris dilatata*, Sp. nov. Fig. 4. & 4^a *Asterophyllites gracilis*, Sp. nov.





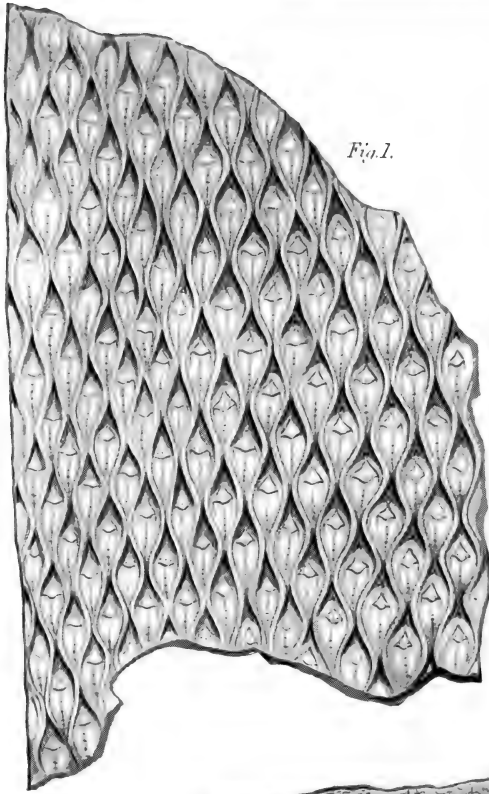


Fig. 1.

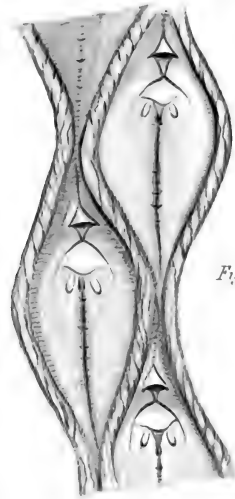


Fig. 1^a

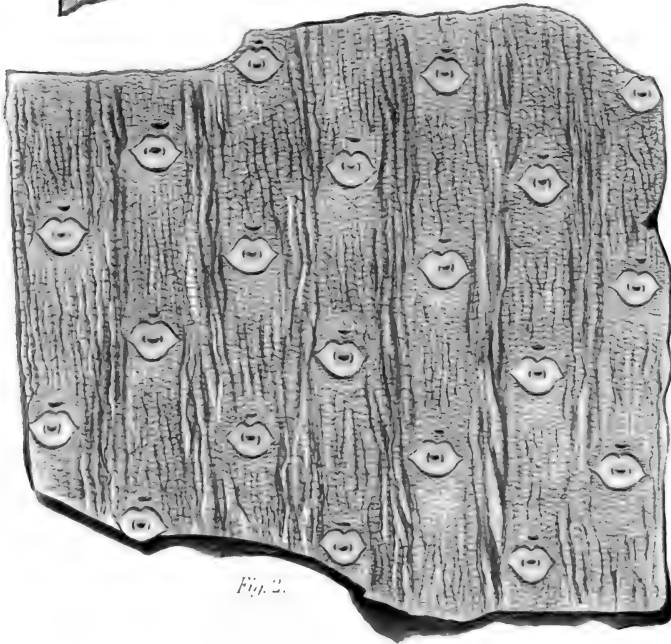


Fig. 2.

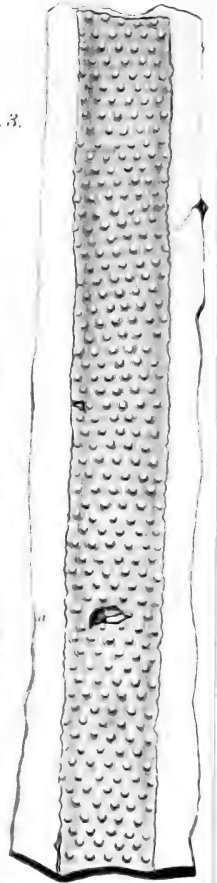


Fig. 3.

Leo Lesquereux del.

Houf. sc.

Fig. 1. & 1^a *Lepulodendron modulatum*, Lsq.^s. Fig. 2. *Sigillaria reticulata*, Sp. nov.
Fig. 3. *Halonia pulchella*, Sp. nov.

high as broad, emarginate, cordate above, round obtuse below, with obtuse lateral angles. Vascular scars three, the medial one semilunar or round, the lateral ones straight or scarcely arched. Habitat, Male's coal-bank.

9. *Halonia pulchella*, Sp. nov. (Pl. 3, fig. 3). Stem apparently slender, straight, scarcely branching, marked by small elevated points or tubercles. Among the few species which have been published of this genus, and which apparently all belong to the subconglomerate coal, none presents as fine and as regular an appearance as this in the disposition of the tubercles. The depression marked at *a* is apparently the place of a branch. Locality: Male's coal-bank.

10. *Diplozegium truncatum*, Sp. nov. (Pl. 4, fig. 1). Stem apparently broad, marked by elevated, half-round, elongated, truncate scars, which are the base of broken leaves. These scars are regularly placed in spiral $\frac{1}{2}$ rows. This species could be referred to a *Knorria* but for the abrupt and irregular fracture of the point of the scars. Locality: Male's coal-bank.

11. *Lepidodendron diplozegioides*, Sp. nov. (Pl. 4, fig. 2). In Mr. Corda's description of *Diplozegium Brownianum*, the decorticated part of the stem shows rhomboidal scars somewhat resembling those of this figure. It may thus be that the specimen described here is referable to the former species though the scars are very different. They appear related to a true *Lepidodendron*, nearly related indeed by the central scar to *Lepidodendron sigillarioides*, Lsqx. Till some better specimens are found, the name can be preserved. Found in the shales of Frog-bayou coal-bank.

12. *Lepidophloios irregularis*, Sp. nov. (Pl. 4, fig. 3.) Stem tree-like; bark covered with scales left by the base of the deciduous leaves; scars rhomboidal, irregularly placed and of various size, with a broadly rhomboidal small scar at its upper part, showing the place of attachment of the leaves, and marked by three vascular points. The specimen figured here is the only part found at Male's coal, except a still smaller specimen found at James's Fork of Poteau. The scales either covering part of the scars, or detached, are visible enough, apparently lacerated and reflexed. But the irregularity of the scars may be due to a mechanical action of compression or decomposition, and a larger piece of the species would be needed to indicate its true characters.

13. *Cardiocarpon ingens*, Sp. nov. (Pl. 4, fig. 4, and 4*a*.) A large and beautiful fruit, heart-shaped in its general outline, deeply notched at the point and surrounded by a broad, narrowly striated margin. Though fig. 4*a* is more pointed, it appears to represent the same species as fig. 4. Both were found at Male's coal, and a specimen like fig. 4 was found also at Frog Bayou.

14. *Cardiocarpon affine*, Sp. nov. (Pl. 4, fig. 5.) Perhaps this species represents an unripe or undeveloped state of the former. It is rounded at the base, pointed at the top, marked by a cordiform, basilar depression

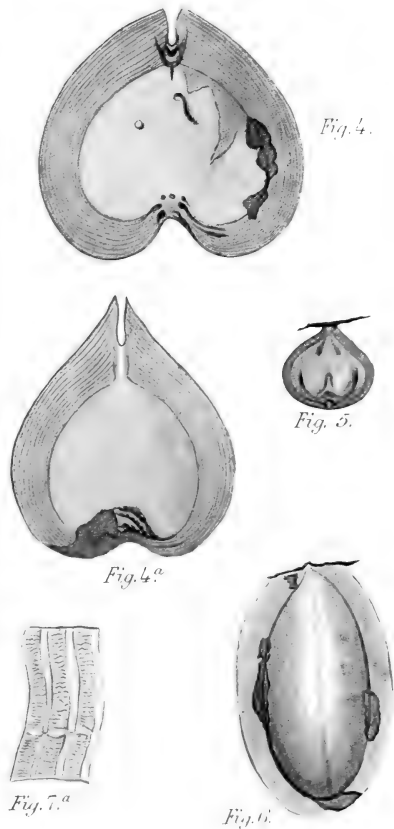
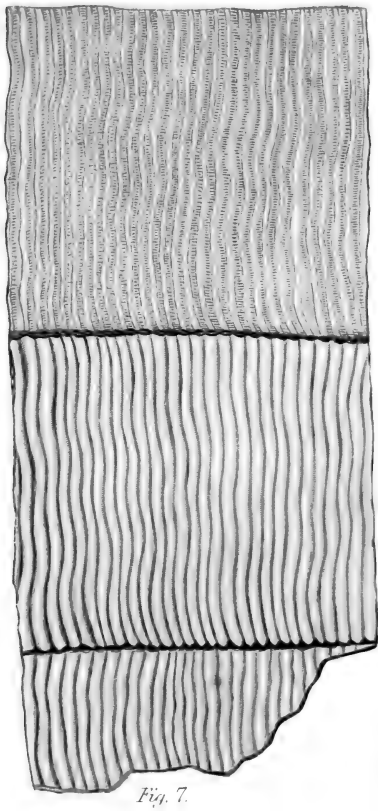
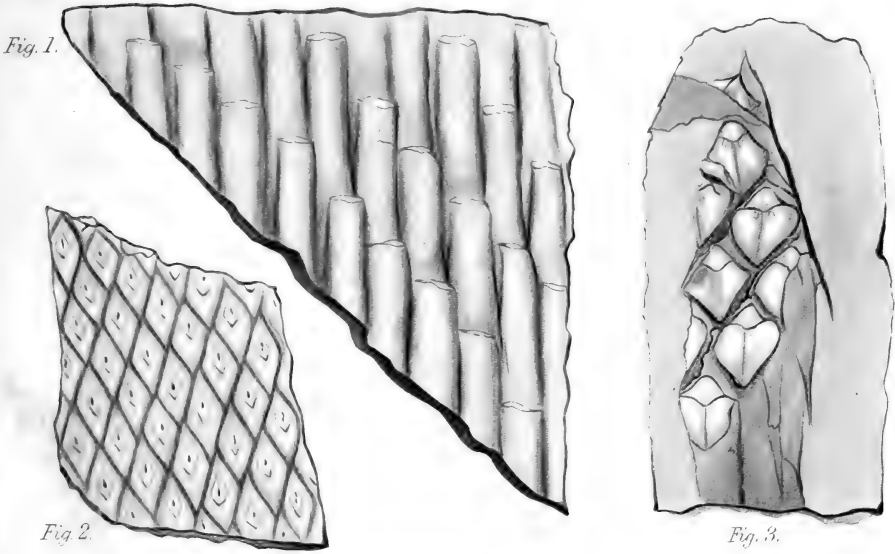
which, in the specimen, is filled with a coaly matter, and which looks like the place of a kernel. The top is also marked by two diverging small hollows appearing like the two cotyledons of certain fruits of our time. This is said only concerning the form, and not to show any relation whatever between the fruits of the coal and those of the dicotyledonous plants which cannot belong to the coal. If by the ripening and the enlarging of this fruit the marked depressions became joined together, and if the outer envelope marked by the striated margin *a* was destroyed, we would have just the same form in this species as the one marked fig. 4. Hence the name given to it. It was found both at the same places and on the same shales as the former.

15. *Carpolithes platimarginatus*, Lsqx. This fruit has the form of an almond, and might be perhaps referred to *Carpolithes amygdalæformis*, Göp. & Berg. It has already been published in a different form for the Report of the State Geological Survey of Pennsylvania. The general outline is oval, but it is often enlarged at the base, more pointed above, and with a narrow margin or no margin at all. It was found at Male's coal-bank and Lee creek, and ascends above the Conglomerate; at least in Pennsylvania it was found in the lowest coal of Trevorton, between two beds of conglomerate.

16. *Calamites undulatus*, Sternb. (Pl. 4, fig. 7, and 7 *a*.) This species is common enough in America and in Europe, in connection with the lowest strata of the coal. It has been already published by different authors; but the articulations have never been figured and described; and as this species is considered by some as doubtful, or only as a variety of *Calamites canncæformis*, Brgt., it becomes, in the form in which it is published, as interesting as a new one. The ribs, in the natural and corticated state are smooth, irregularly undulated, separated by a deep smooth furrow. In the decorticated state, or when the carbonaceous pellicle which covers the stem is removed, the ribs appear nearly flat, marked by horizontal and numerous wrinkles separated by a broad smooth line (fig. 7 *a*). On the articulations which are deeply marked, the base of each furrow is marked by an oval point which is scarcely a tubercle, and which varies in its form and size.

17. *Sphenopteris decipiens*, Lsqx. (Pl. 5, fig. 1, and 1 *a*.) A bipinnately divided branch of fern with short, lanceolate, somewhat obtuse pinnæ and variable pinnules mostly round in outline. By the form of the leaflets this species has a great likeness to *Alethopteris nervosa*, Brgt., but differs by its peculiar nervation; the somewhat thick medial nerve running along the rachis to its point of attachment (fig. 1 *a*). The nervules of this species are generally obsolete and scarcely visible. In *Alethopteris nervosa* they are, on the contrary, deep and well-marked. Found at James' Fork of Poteau.

18. *Neuropteris tenuifolia*, Brgt. (Pl. 5, fig. 2 to 6.) Though this species



Leo Lesquereux del.

Dringal sc.

Fig. 1. *Diplotegium truncatum*, Sp. nov.. Fig. 2. *Lepidodendrum diplotegioides*, Sp. nov..
 Fig. 3. *Lepidophloios irregulare*, Sp. nov.. Fig. 4. & 4^a. *Cardiocarpon ingens*, Sp. nov..
 Fig. 5. *Cardiocarpon affine*, Sp. nov.. Fig. 6. *Carpolithes platimarginatus*, Lsq^r. Fig.
 7. & 7^a. *Calamites undulatus*, Stemb..





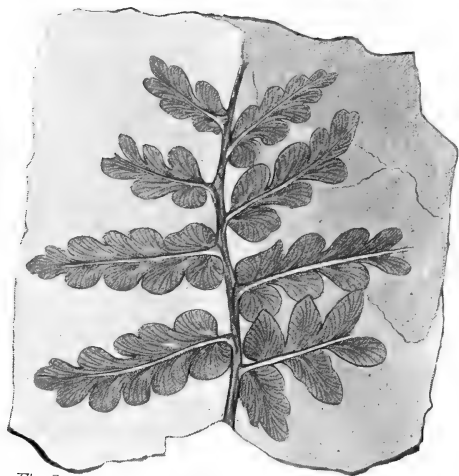


Fig. 1.

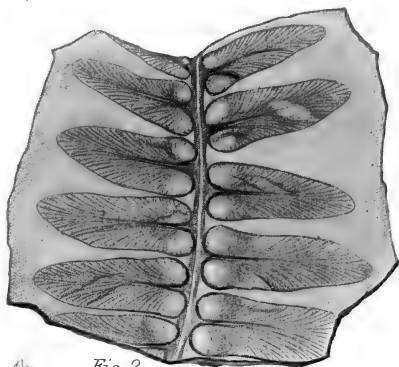


Fig. 2.

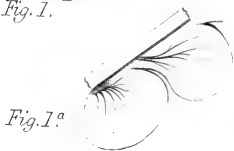


Fig. 1.°



Fig. 8.

8.°



3.



4.



5.



Fig. 6.

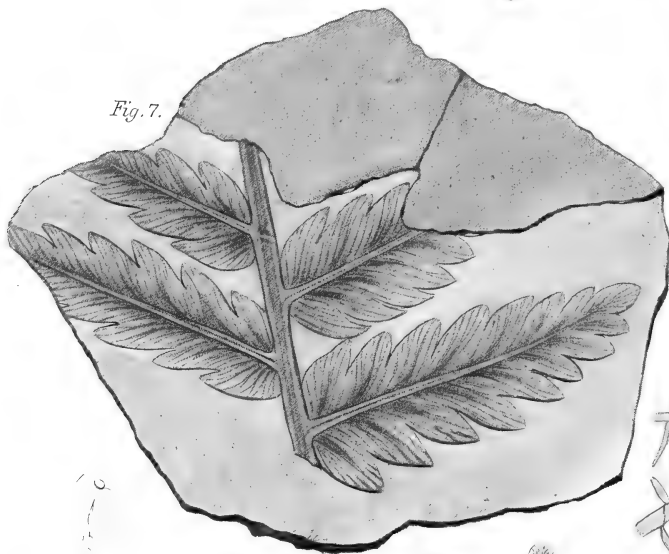


Fig. 7.

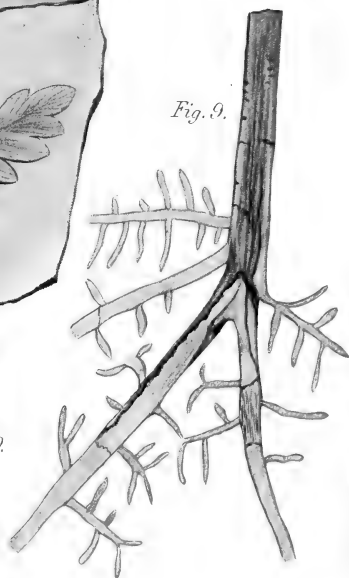


Fig. 9.



Fig. 11.



Fig. 10.°



Fig. 10.

Fig. 12.

Les Lesquereux del.

Dougal sc.

Fig. 1. & 1.°. *Sphenopteris decipiens*, Lsq^l. Fig. 2. to *C. Neuropteris tenuifolia*, Brg^l. Fig. 7. *Odontopteris intermedia*, Sp. nov.. Fig. 8. & 8.°. *Rhabdocarpus minutus*, Sp. nov.. Fig. 9. *Rhizolites pulmatitidus*, Sp. nov.. Fig. 10. & 10.°. *Dyctiopteris obliqua*? Brub.. Fig. 11. *Blattina venusta*, Sp. nov.. Fig. 12. Wing of *Blatta Maderae*, Fabr..

resembles *Neuropteris flexuoso*, Brgt., it is easily distinguished by the more generally rounded base of the leaflets. It is very variable in size, and sometimes the leaflets are expanded on one side and somewhat auriculated. The veinlets, though thin and generally divided two or three times, are more distinct than in *Neuropteris flexuosa*. The species is interesting with regard to its distribution, and it was worth figuring it here because the Arkansas specimens show for the first time two extreme sizes of the leaflets of that fern. Fig. 2 is a very large, and fig. 6 a very small form, which have not been published before. Moreover, at least in America, the species looks peculiar to the lowest coal. It was found in abundance at Shamokin, Pennsylvania, in connection with the lowest bed of coal, either just above the Conglomerate, or between two strata of that formation. In Europe, if there is identity in the species, it has been found as high as the New Red Sandstone. It was seen at all the openings of the coal of Arkansas.

19. *Odontopteris intermedia*, Sp. nov. (Pl. 5, fig. 7.) This species appears to be intermediate between *Odontopteris Brardii*, Brgt., and *Odontopteris crenulata* of the same author. It differs from the former by shorter leaflets united to the middle, and by the basilar inferior leaflet which does not differ in form from the other, and is separated from the last species by entire leaflets and a more straight nervation. In our species, the leaflets are somewhat obtuse; the medial nerve is marked sometimes, or entirely obsolete; the nervules are very thin and obsolete. Both primary and secondary rachis are broad and flat. Better specimens will be needed to fix the validity of this species which, in any case, has not been found till now in America, but at Jenny Lind prairie coal-bank.

20. *Rhabdocarpus minutus*, Sp. nov. (Pl. 5, fig. 8 and 8a). A small fruit, of which the natural size, fig. 8, is enlarged, fig. 8a. It is oval in outline, marked with a small notch at the base, and regularly and minutely ribbed. Found at James' fork of Poteau, and at Male's coal-bank.

21. *Rhizolites palmatifidus*, Sp. nov. (Pl. 5, fig. 9). Evidently a root, perhaps the root of *Cordaites Borassifolia*, Ung.; this last species being found in great abundance in connection with this root at Frog bayou coal-bank. With this root there was at the same place a fine branch of a *Stigmaria*, with distant leaves, scars very small, irregularly placed, and more distant than in any other species of this genus. It might perhaps be referred to *Stigmaria irregularis*, Lesq., of the Pennsylvania Geological Report. Want of room prevents its being figured.

22. *Dyctiopteris obliqua?* Bunb. (Plate 5, fig. 10 and 10b). This small leaflet, fig. 10, enlarged fig. 10b, is referred with doubt to this species. It belongs evidently to a species of the genus *Dyctiopteris*. But the leaflet is too small and too regular to agree with the species. Nevertheless, as nothing more was found of this plant but the small leaflet, it is not sufficient to give characters to a new species. Found at James' Fork of Poteau.

23. *Blattina venusta*, Spec. nov. (Pl. 5, fig. 11.) It is one of the most interesting remains found in the coal formations of America. It shows the upper wing, partly broken, of an insect related to the genus *Blatta*, of which our common cockroach (*Blatta Americana*) is a species. Prof. Germar has already figured and described in Germany some of these always very rare remains; but our species differs much from all those which have been found in the coal of Europe. The wing represented, fig. 12, belongs to the still living species, *Blatta Maderæ*; it is copied from the figure of M. Germar, and shows the greatest likeness to ours. Its nervules are also, though more remotely, marked by transverse reticulations. This fossil wing found in the shales of Frog bayou, has apparently its extremity broken out, and its general outline is likely the same as that of fig. 12. The presence, in the coal-measures, of insects of which the identical type has been preserved till our epoch, is a remarkable phenomenon of natural history, and could not be but carefully recorded.

SPECIES OF FOSSIL PLANTS FOUND AT DIFFERENT LOCALITIES IN THE
SUBCONGLOMERATE COAL-BEDS OF ARKANSAS.

	Male's Coal- bank.	Lee Creek.	Frog Bayou.	Jenny Lind Prairie.	James' Fork of Poteau.
1. <i>Alethopteris nervosa</i> , Brgt.,			"		"
2. <i>Alethopteris Owenii</i> , Sp. nov.,	"	"			"
3. <i>Annularia sphenophylloides</i> , Ung.,				"	"
4. <i>Asterophyllites equisetiformis</i> , Sternb.,					"
5. <i>Asterophyllites gracilis</i> , Sp. nov.,	"				
6. <i>Blattina venusta</i> , Sp. nov.,			"		
7. <i>Bornia?</i> Sp. nov.,	"				
8. <i>Calamites approximatus</i> , Sternb.,	"			"	"
9. <i>Calamites cruciatus</i> , Brgt.,	"				"
10. <i>Calamites undulatus</i> , Sternb.,					"
11. <i>Cardiocarpon affine</i> , Sp. nov.,	"				
12. <i>Cardiocarpon ingens</i> , Sp. nov.,	"		"		
13. <i>Carpolithes platimarginatus</i> , Lsqx.,	"	"			
14. <i>Cordaites borassifolia</i> , Ung.,	"		"		
15. <i>Cyclopteris</i> (broken specimen),					"
16. <i>Diplotegium truncatum</i> , Sp. nov.,	"				
17. <i>Halongia pulchella</i> , Sp. nov.,	"				
18. <i>Hymenophyllites flexicaulis</i> , Sp. nov.,	"	"			
19. <i>Hymenophyllites</i> , Sp. nov.,*					"
20. <i>Lepidodendron diplotegioides</i> , Sp. nov.,			"		
21. <i>Lepidodendron modulatum</i> , Lsqx.,	"		"		
22. <i>Lepidodendron vestitum</i> , Lsqx.,	"				"

* Specimens too small for close determination.

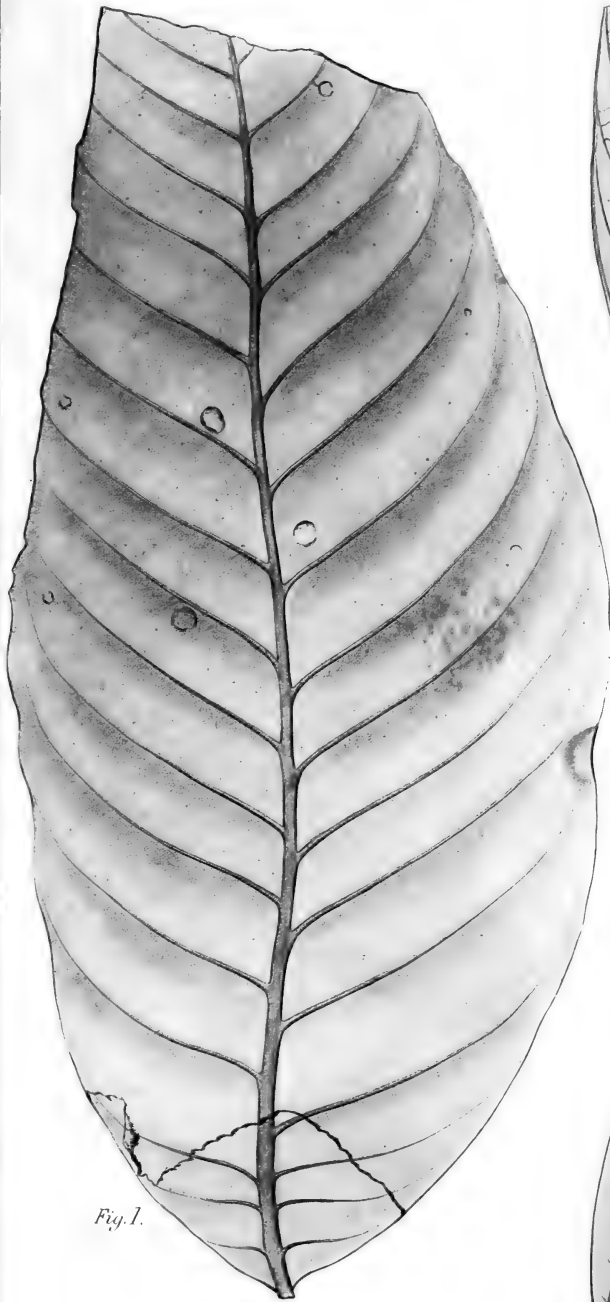


Fig. 1.



Fig. 2.



Fig. 3.

Leo Lesquereux del.

Dougal sc.

Fig. 1. *Magnolia Hilgardiana*, Sp. nov.. Fig. 2. *Rhamnus marginatus*, Sp. nov..
 Fig. 3. *Quercus Saffordii*, Sp. nov..



	Male's Coal- bank.	Lee Creek.	Frog Bayou.	Jenny Lind Prairie.	James' Fork of Poteau.
23. <i>Lepidophloios irregulare</i> , sp. nov., . . .	"				"
24. <i>Lepidophyllum brevifolium</i> , Lsqx., . . .			"		
25. <i>Lepidophyllum lanceolatum</i> , Brgt., . . .		"			
26. <i>Lepidophyllum</i> , leaves of <i>Lepidodendron</i> ,	"	"	"	"	"
27. <i>Lepidophyllum majus</i> , Brgt.,	"	"			
28. <i>Neuropteris fimbriata</i> , Lsqx.,				"	
29. <i>Neuropteris hirsuta</i> , Lsqx.,				"	"
30. <i>Neuropteris tenuifolia</i> , Brgt.,	"	"	"	"	"
31. <i>Neuropteris vermicularis</i> , Lsqx.,				"	"
32. <i>Odontopteris intermedia</i> , Sp. nov.,				"	
33. <i>Pecopteris villosa?</i> Brgt.,				"	"
34. <i>Rhabdocarpus minutus</i> , Sp. nov.,	"				"
35. <i>Rhizolithes palmatifida</i> , Sp. nov.,			"		"
36. <i>Sigillaria reticulata</i> , Sp. nov.,	"				
37. <i>Sigillaria</i> , Spec. nov.,	"				"
38. <i>Sphenophyllum bifurcatum</i> , Sp. nov.,	"		"		"
39. <i>Sphenophyllum longifolium</i> , Gutb.,					"
40. <i>Sphenophyllum Schlotheimii</i> , St.,				"	"
41. <i>Sphenopteris dilatata</i> , Sp. nov.,	"				
42. <i>Sphenopteris decipiens</i> , Lsqx.,				"	
43. <i>Sphenopteris Gutbieriana</i> , Germ.,					"
44. <i>Sphenopteris obtusiloba</i> , Brgt.,	"	"	"	"	
45. <i>Staphyllopteris stellata</i> , Sp. nov.,	"				
46. <i>Stigmaria ficoides</i> , Brgt.,	"				
47. <i>Stigmaria irregularis</i> , Lsqx.,			"		"
48. <i>Stigmatocanna?</i>	"				

From a view of this table, the following conclusions can be drawn. That of forty-eight enumerated species, eighteen are new, and consequently have not been found above the Millstone Grit. Two more, represented by broken specimens, are perhaps new also, and thus 26 to 28 species of the Arkansas coal have been found before in strata of coal above the Conglomerate formation, at other places in the United States coal-fields. I doubt not that if we had had a whole day to spend at Male's coal-bank instead of an hour, we would, with the assistance of Mr. Cox, have collected at least a dozen other new species. But the number of old and already known species would have been greater also, since in a hurried examination I could note only the most marked species which were seen. Therefore the coal plants of the Male's bank may be considered as presenting in a fair average the proportion of old and new species of plants pertaining to the coal-beds below the Millstone Grit. Admitting this, I do not think that this proportion of new species of plants of the Arkansas coal-measures authorizes a separation of these measures from the beds above the Conglomerate; permitting the dis-

inction of another name (that of *false coal-measures*), as if they were a peculiar formation. The proportion of large species and fossil trees appears to be greater in Arkansas. But the same proportion continues, though in decreasing order, till we reach coal No. 1 A and coal No. 1 B above the Millstone Grit. And certainly the difference in the species between these last strata and coal No. 4 placed at the base of the Mahoning Sandstone, at a distance of about 250 feet, more or less, would appear far greater than between the Subconglomerate coal of Arkansas and coal No. 1 B.

New discoveries of fossil plants by the Geological State Survey of Illinois show the proportion of large trees increasing as far down as below the Upper Archimedes Limestone, where a thin bed of coal is sometimes present, as at Fayetteville. Nevertheless, the plants of this low position are still of the same genera as those of the true Coal-measures, and half of them, at least, have the same specific characters. Thus, it is evident that the true Coal-measures descend as low as the Subcarboniferous Limestone and even can be counted to the second bed of the Archimedes Limestone. Not much coal is formed there, it is true, but it is the beginning, the infancy of the epoch, which, as at the time of its decrepitude and near its end, has the strata of combustible matter scarcely formed and thin.

It is impossible now to establish a close comparison between the strata of the Old Red Sandstone of Pennsylvania and the Subcarboniferous Limestone of the West, which, following the assertion of some geologists, occupy its place. From some data formerly collected, the Red Sandstone of Pennsylvania had very few species, if any, identical with those of the Coal-measures. It is characterized especially by the species of true *Noeggerathia* which have never been found in connection with the coal, and which I have found in abundance in the red shales immediately underlying the conglomerate formations of Mauch Chunk and Pottsville, and lower still.

It would be even more difficult to compare the distribution of the plants of the Coal-measures and of the New Red Sandstone or Permian overlying them. The Permian is scarcely known in America, and no plants have been found in it. But in Europe, the proportion of the vegetable species common to the Permian and the Coal-measures is no more than eight per cent, while between the Subconglomerate coal and the Coal-measures above the Conglomerate, the proportion of common species is from fifty to fifty-five. Moreover, with the appearance of the Permian, a number of entirely different typical forms, mostly Coniferæ (*Araucarites*, *Walchia*, *Pinites*, &c.), appear at once; and these forms having no relation whatever to the genera of plants of the coal-measures indicate a new epoch in the vegetation. Thus it is certain, that if we should separate, as some geologists have done, the Subconglomerate coal as a peculiar formation, we would do it against the general laws of distribution of the species and

would be forced to consider each peculiar bed of coal as a separate formation or rather as an epoch.

The other conclusions taken from the examination of the table are in favor of the horizontal identity of all the coal strata of Arkansas, the apparent difference in their species resulting from the small number of fossil plants which have been found at some localities. Thus the coal of James' Fork of Poteau where, after Male's coal-bank, the largest number of fossil plants were seen, has, in twenty-five species, ten species in common with Male's coal, some of which are new and apparently truly characteristic of the subconglomeratic coal. Of ten species collected at Jenny Lind coal-bank, eight were seen also at the James' Fork of Poteau. Seven of the eight species of Lee creek coal have been found also at Male's, and of eleven fossil plants found in the shales at Frog Bayou, seven belong also to Male's coal-bank. Taking into consideration the insufficiency of the researches and the distance of the coal-banks where the plants were found, it is easily admitted that this approximate identity of species shows with great probability, if not with certainty, that the coal-banks or strata reported above are to be placed on the same geological horizon.

LIGNITES OF ARKANSAS, AND FOSSIL PLANTS OF THE SAME FORMATION.

The Lignite formation is easily distinguished from the Coal-measures, as well by its distribution, its geological position, the chemical compounds of its combustible matter, as by the plants by which it is accompanied. From the few data which have been collected in Arkansas it appears that the lignites of that State are found generally near the base of the Tertiary measures.* They have been formed by an accidental deposition of a certain quantity of wood, apparently transported by rivers or some other agency, or even perhaps are composed of the heaped remains of trees which grew in marshes and swamps at the place where beds of lignites are now found. The areas which they cover with strata of combustible matter is extremely variable. Sometimes they extend themselves for hundreds of miles, preserving a constant horizon; sometimes they have only a few feet in diameter, and appear either thin or like a broken and heaped compound of combustible black matter, irregularly placed at various horizons in the same vicinity. Beds of Lignites are generally intermixed with clay or sand. Their overlying strata are not shales, but mostly soft, black or yellow plastic clay or sand. The numerous remains of plants found in this soft matter are of course decayed, broken, and undistinguishable.

The only bed of Lignites which I had an opportunity of examining in

* See Sections in the Report of the State Geologist.

Arkansas, is exposed on Little Cypress Creek, Dallas county, on the property of Mr. Watson. It crops out on the nearly perpendicular and much disturbed bank of the creek, is one to two feet thick, sometimes black and a compound of pure combustible matter much softer than stone coal or true coal, sometimes formed of alternate layers of soft clay with bands of black and pure lignite, from one to two inches thick. There are apparently two beds of lignite exposed on this bank. The one, nearly at the top of the bank, is overlaid by one foot of black soft clay covered with about twenty feet of argillaceous sand. The other exposed a little lower down the creek appears separated from the former by nine feet of soft plastic clay without plants. As the bank has been much disturbed by the erosions of its soft parts, which have caused slips and local subsidences, it is still possible that there is only one bed of lignite formed there, parts of which have accidentally been broken off and dropped down the declivity of the bank.

In counties where wood is still abundant, beds of tertiary lignites are perhaps, for the present, of no great value. Nevertheless, when the combustible mineral is pure, the amount of carbon which the matter contains is always greater than it is in wood. Following the analysis of two specimens of lignite of Green county,* the amount of carbon in the matter is fifty-three to fifty-seven per cent., when the carbon of wood does not amount to more than forty to forty-five per cent. Thus, these beds of lignites may become valuable in the future, especially for the navigation of the steamboats on the rivers.

As beds of lignite, found in the southeastern part of Arkansas have been taken sometimes for strata of true mineral coal by persons unacquainted with the distribution of the geological formation, it is well to present in a single table, and for comparison, some of the fossil leaves which are generally found in connection with these beds of recent origin. All the leaves found fossil in the Tertiary, recall forms which we are in the habit of seeing around us on the trees of our time. Most of the genera, even some of the species are the same. Thus we have with the lignitic formation, fossil leaves of the oaks, walnuts, beeches, magnolias, elms, and others; mostly leaves of Dicotyledonous trees, easily recognized by the branching of the veins. On the other hand, the fossil leaves of the true coal are mostly ferns, and the other remains represent the scars on the striæ of the bark of trees of which the form, the direction and the remarkable regularity is entirely at variance with the rough and irregular surface of the bark of our trees. (See Pl. 3, fig. 1, 2, and 3.)

The leaves figured on Plate VI were not found in the tertiary strata of Arkansas. The time of exploration was too short to permit researches

* 1st volume of the Report, p. 177.

for fossil leaves, which could be found only by opening the clay-banks overlying the lignites. But they were taken from the chalk-banks of the Mississippi and from the red shales of Tennessee, of which the position is apparently a little superior to the place generally occupied by the beds of lignite and certainly of the same age.

DESCRIPTION OF FOSSIL LEAVES OF THE TERTIARY.

1. *Magnolia Hilgardiana*, Sp. nov. (Pl. 6, fig. 1). Apparently a leaf of a new species of the beautiful genus *Magnolia*. It has a great likeness to *Magnolia tripetala*, Michx. (the umbrella-tree), but is rounded and not pointed at its base. The nerves marked on the figure are a little broader than on the specimen. The primary and secondary nerves are strong and distinct, much curved upwards near the margin of the leaves. The tertiary veinlets are obsolete, at least on the specimens figured here, but from other specimens appear nearly straight and perpendicular to the secondary veins. The margin of the leaves and their surface is undulated. The specimens were communicated by Prof. Eug. W. Hilgard, to whom this species is dedicated.

2. *Rhamnus marginatus*, Sp. nov. (Pl. 6, fig. 2). This leaf, from various broken specimens of the same species, appears to have been generally oval-lanceolate, somewhat obtuse, and entire. The nervation is distinct. Primary and secondary nerves broad and thick, tertiary veinlets perpendicular to the secondary veins and about continuous. The secondary veins curving upwards and running up along the borders give to the leaf the appearance of being marginated. It is related to *Rhamnus Carolinianus* (Walt.), (the Carolina buckthorn), a common species in Arkansas. The fossil plant is found in the red shales of Tennessee and also, apparently at least, in the chalk-banks of Columbus, Kentucky.

3. *Quercus Saffordii*, Sp. nov. (Pl. 6, fig. 3). A very fine species of oak which, as far as I know, has no relation with any species now living on the continent of America. The leaves are nearly linear, from four to six inches long, taper pointed, with the margins cut by sharp, regular, distant teeth to near the base, where they are narrowed in a short petiole. The medial nerve is broad and flat; the secondary nerves are of two kinds; long and running to the points of the teeth; or intermediate to them and shorter. This species was found and communicated by Prof. James M. Safford, State Geologist of Tennessee, whose name it bears.

RECENT BOTANY AND GENERAL DISTRIBUTION

OF THE

PLANTS OF ARKANSAS.

GENERAL REMARKS.

THE distribution of the plants of a country, according to the nature of its geological formations, is extremely difficult to settle with any chances of reliability. It has been asserted with apparent reason :

1st. That it is still uncertain if the chemical elements of the soil, even if it was proved that they are directly depending on the nature of the underlying geological strata, have a perceptible influence on the vegetation which naturally covers any peculiar place. That, in any case, the amount of influence which the chemical constitution of the soil exercises upon the distribution of the vegetation is still problematical.

2d. That the geological elements, viz., the particles resulting from the decomposition of the rocks and entering into the composition of the soil, even if their influence on the vegetation were well marked, are generally disseminated by water and atmospheric agency to a great distance from the areas occupied by the formations from which they come. The lime of a limestone ridge, the sand of a mountain of sandstone are carried down the declivities, spread over other kind of rocks, transported to the alluvial plains, or deposited on the banks of rivers and thus mixed together in a peculiar compound which, in its new state, has but an indirect relation to the rocks from which it is derived, and no relation whatever to the formations which it covers. Moreover, the frequent alternations of strata of sandstone and of limestone which compose the rocks of the great Valley of the Mississippi, Silurian, Devonian, Carboniferous, and Tertiary, prevent an exact limitation of the area over which each of them may extend its influence. Thus, it has been generally admitted that physical circumstances more actively govern the distribution of the vegetation of a

country than can chemical constituents of the rocks. Consequently, that the direction of the ridges, the amount of light and atmospheric heat and moisture, the thickness of the soil, its hardness and capacity for retaining water, are the essential causes of the distribution of the plants.

These considerations may be true, but they touch only one side of a complex and difficult question which cannot be discussed now. If the hardness, compactness of a soil, its capacity for retaining water and heat, are essential causes affecting the distribution of the plants, it is evident that this cause depends principally on the chemical nature of the geological strata. On the other hand, if the dissemination of the geological elements renders the task of ascertaining their influence difficult in some places, it is not a reason to reject as useless or impossible any attempt to compare the vegetation of a country with its geological formations. If this comparison can be made anywhere with a chance of success, it is certainly in Arkansas, where the strata are nearly horizontal and extend over vast areas.

The exploration of the Botany of Arkansas began too late and was too short to permit the fulfilling of a work which for its completion would require some years of continual research. The following data collected along our road of travel can thus be considered only as the first points of delineating lines which may be continued and completed hereafter.

MAMMOTH SPRING OF FULTON COUNTY.

The Mammoth Spring of Fulton County has been already described on page 60 of the first volume of this Report. Its water is almost entirely filled with aquatic plants covering its bed even to a great depth or floating on the surface. A phenomenon like this, in a spring of so wide an extent, is remarkable enough to merit an examination.

It is well known that plants absorb by the green surface of their leaves a certain amount of carbonic acid which serves them as food, and which they transform into carbon. Springs emerging from limestone rocks generally contain carbonic acid in small quantity and thus may nourish some plants in their water.

The water of the Mammoth Spring, either by compression or from some other peculiar cause, contains, apparently, in solution, such a great amount of carbonic acid that its surface is in a continuous state of effervescence or bubbling, resembling the effervescence of a fountain of soda water. Perhaps the phenomenon is caused by atmospheric air taken into the water by its running through beds of porous cherty limestone from which it emerges. This would not alter the conclusion, because atmospheric air

containing carbonic acid, has the same influence in promoting vegetation.

Whatever the cause may be, the bottom of the Mammoth Spring, at a depth of four to eight feet, under the clear water of the fountain, is covered with a carpet of moss of a species (*Hypnum noterophyllum*, Sull. & Lsqx.) which generally, and at other localities, grows on stones washed by only a few inches of running water. These mosses, torn in great bunches from the bottom, rising up to the surface and floating with the current, are stopped by the leaves and stems of large water-plants, to which they remain attached, and by continuous agglomeration of other mosses, or broken pieces of plants, they form on the surface of the water, wherever the current is not too strong, floating carpets of green turf, which become strong enough to sustain the vegetation of a few species of land plants. The species generally found with the mosses composing this floating turf are: the Horned Pond-weed (*Zannichellia palustris*, L.) which lives also under deep water, and is uprooted from the bottom; three species of Duck's meat, small round floating plants, which generally live on the surface of ponds, but which are here in an unparalleled abundance, with broken branches of all the other species which vegetate in the spring. The compactness of the floating carpet is still increased by small mollusca, especially by a small species with soft shell (*Physa ancillaria*, Say.) which lives there in immense numbers, feeding upon the decomposed pieces of broken plants. It is especially these mollusca with the Duck's meat which attract the water fowls, providing them with a delicate, never-failing and abundant food. The constant temperature of the water (60°) favors, apparently, the development of animal life, at least for the shells, and is another cause of allurements for the fowls, especially during the winter months.*

A number of other species of plants worth mentioning live in the Spring, attaching their roots to the bottom, and raising their long stems to the surface. Around the principal very deep and central basin of the fountain there are two species of Pond-weed (*Potamogeton natans* and *P. lucens*) with stems at least twelve feet long. Where the water is swifter-running, and not deeper than four to six feet, species of the Water Milfoil, another Pond-weed (*Potamogeton compressus*), the Water Persicaria, the American Brooklime, the Burr-reed, the Water-weed, the Water Starwort (two species) fill the water with the multitude of their long stems and branches. Near the borders, but still in water one foot deep at least, one finds the Marsh Speedwell, the Mint, introduced by the Indians? and growing with great luxuriance, the Spotted Touch-me-not, the Bur-

* It is a remarkable fact that no fishes are found in the spring above the dam. Is this phenomenon caused by the constant temperature of the water, or by the quantity of air or carbonic acid which it evolves?

Marigold, the Water-cress, probably also introduced, the Penny-wort, the Water-Parsnip, and some other species.*

Some of these plants, especially the Pond-weed (*Potamogeton compressus*, L.), the Water Persicaria, the American Brooklime, grow in the bed of Spring River, below the bed of the Mammoth Spring. The cattle of the vicinity greedily feed on them, and thrive finely, though spending whole days in water. The two last species of plants, when growing on wet soil, as they generally do, and under atmospheric influence, are somewhat bitter, hard, and scarcely touched by the cattle. Under water they are subjected, by deprivation of a full light, to a kind of chlorosis or etiolation, which renders them tender and nutritive. The Indian rice and the Rice cut-grass grow also below the dam along the muddy banks.

I truly regret that it does not come within my province to dwell on the natural beauty of the Mammoth Spring and of the hilly country surrounding it. The place will doubtless in the future acquire great importance as affording a healthy and pleasant place of summer resort.

PRAIRIES OF ARKANSAS.

Before entering into the examination of the botanical distribution characteristic of the part of Arkansas which I explored, there is still a peculiar question which cannot be easily treated elsewhere, and which calls at once for an examination.

The Prairies of Arkansas do not appear to have been formed all in the same manner. They are underlaid by different formations, situated at various elevations, and their general aspect differs apparently so much, that it looks as if a peculiar law had directed the formation of each of them.

I have explained elsewhere† the general formation of the prairies, and ascribed it to the agency of water. All the prairies still in a state of formation along the great lakes of the North are nothing else but marshes slowly passing to dry land by slow recession of water. When land is continually covered by low stagnant water, its only vegetation is that of the Rushes and of the Sedges. When the same land is alternately subjected to long inundations and then to dryness, during some months of the year, the same plants continue to cover it. By their decomposition these marshy plants produce a peculiar ground, either black, light, permeable when it is mixed with sand, as it is near the borders of the lakes, or hard, cold, impermeable when it is mixed with clay or muddy

* For Latin names and for other species of plants of the Mammoth Spring, see Catalogue of the Plants of Arkansas.

† Bulletin of the Society of Natural Sciences of Neuchatel (1856).

alluvium, as in some marshes underlaid by clay or shales, or along the banks of some rivers. Land continually covered with stagnant water cannot produce any trees, because the trees require for their growth, like most of the terrestrial plants, the introduction of atmospheric air to their roots. Neither do trees germinate and grow on a ground alternately covered with stagnant water and exposed to dryness for some months of the year. From these considerations, the law of the general formation of the prairies can be deduced: While a land or a part of a country is slowly passing from the state of swamp or marsh to the state of dry land the annual alternative of stagnant water and dryness causes the vegetation of peculiar plants, which, by their decomposition, form a peculiar soil unfavorable to the growth of the trees. From this general rule of formation, which regards only the prairies of the Mississippi valley,* all the different phenomena or peculiar appearances of the prairies can be easily explained.

The prairies of Arkansas, following their vegetation and their geological connection, may be separated into three classes:

- 1st. The prairies of the North, mostly underlaid by cherty limestone.
- 2d. The prairies of the West, on carboniferous shales and clay.
- 3d. The prairies of the South and East, overlying tertiary and alluvial formations.

1st. The limestone prairies of North Arkansas mostly belong to the counties which are examined in the next division. They are singular in this fact, that their surface is not always flat, and that they are mostly placed on soft declivities or coves along or between the ridges. They are mostly of small extent and surrounded by thickets of low trees. The compact or somewhat porous Subcarboniferous Limestone which they cover does not absorb water with rapidity. Hence, in the spring, water percolates slowly along the slopes, taking with it the detritus of the stone, and depositing it where its course is either stopped or slackened. A scant swamp vegetation springs up there, its decomposed remains are mixed with the original deposit, which, by and by, augments in thickness under the action of water and of vegetation. This soil is naturally spongy, preserves water for a part of the year, like the peat, which it resembles, and thus cannot sustain trees. They establish themselves on a firmer ground all around. When by successive contribution of limestone deposited by water and of particles of humus received from the plants this soil has become thick enough, it is, when drained by a few ditches (serving as channels for the water of the rainy season), a fertile and easily cultivated ground. The channels of drainage are generally formed by a natural depression, the depth of which varies with the thickness of the soil of each

* The prairies of the far West, along the eastern base of the Rocky Mountains, are true sandy deserts, caused by the dryness of the atmosphere.

prairie. In this case, as coarser materials are of course heaped on the banks of these creeks, a few trees grow along them. They are mostly stunted specimens of the Post-Oak, the Rock Chestnut Oak, the Persimmon, the Mockernut, the Juniper, and a shrub, *Bumelia lanuginosa*, Pers. The characteristic herbaceous plants of these limestone prairies are especially: *Ambrosia polystachya*, *Kuhnia Eupatorioides*, *Aster sericeus*, *Croton capitatum*, *Grindelia lanceolata*, *Palafoxia callosa*, *Oxibaphus albidus*, &c., species which are not found on the prairies of other formation. Besides these plants they are covered with a great number of species belonging to the prairies in general.

Between this and the second division of the prairies, viz., of those which are formed on the Carboniferous shales and clay, there is a remarkable transition, which unites both divisions, or rather shows their common origin. In the western parts of Benton and the northern part of Washington counties some flat prairies, formed like those of the second division, and underlaid by shales or red clay, have still at their surface some isolated patches of Subcarboniferous cherty limestone, which appear here and there, breaking the general horizontality like small mounds. Possibly these low mounds could support the vegetation of the trees, and they may have been transformed into prairies by the influence of fire, which is a secondary agent of their formation. But the soil which covers them is exactly of the same nature as the soil of the surrounding prairies, and as their height is no more than two or three feet, they may have been formed in the same manner and by the agency of water.

2d. The prairies on the Carboniferous shales are generally flat, surrounded by hills, or at least by a higher border, which gives them the appearance of the bottom of drained lakes. These prairies are of various extent, and although they may overlie different kinds of ground or geological formation, in Arkansas they are generally underlaid by Carboniferous fire-clay or shales. In the spring they are covered with water which cannot percolate, and become true marshes for a time, and have the vegetation of marshes: the rushes and the sedges. This semi-aquatic vegetation gives, according to the nature of the underlying strata, either a hard, compact, cold soil, by decomposition of shales or clay; or, when mixed with sand, the peaty black soil of the prairies of Illinois and of the Northern States. In the summer months, these marshy prairies become dry by evaporation, and as it happens with the prairies of the first section, the alternative of too much water and of dryness in the soil prevents the growth of trees.

These prairies are more sterile or rather more difficult to cultivate than those of the former section, as we shall have occasion to see when examining the counties of Sebastian, Franklin, &c., where this kind of prairie is mostly found. A few trees,—the Water Oak, the Pin Oak, the Honey

Locust,—grow along the creeks which meander in their middle. The soil is, in its natural state, mostly covered with the great Compositæ of the prairies and the hard grasses, species of Beard-grass and Broom-corn.

The prairies of the third class are extensively formed in Arkansas on the Tertiary or Alluvial land bordering some rivers of the South, especially Red River. Our exploration did not extend to that part of the State. It is very probable that these prairies have been formed in the same manner and by the same agency as those of the other sections. From the catalogue of Mr. Nuttall, who explored these plains, their plants appear somewhat different from those of the other prairies. They rather bear the character of a Western Flora, or of the Flora of the plains extending toward Mexico.

GEOLOGICAL NATURE OF THE SOIL AND VEGETATION IN FULTON, MARION,
CARROLL, MADISON, AND BENTON COUNTIES.

The characteristic formations of all these counties are: the Silurian either cherty or compact limestone, with some strata of sandstone, and the Subcarboniferous cherty or compact limestone, with alternating beds of shales or of sandstone. The geographical character of the country is that of a plateau divided into a series of successive ridges by numerous clear creeks, mostly running southward or northward to White River, or by some of its forks. When these ridges are composed of compact, hard magnesian limestone, they are nearly barren, the top only being covered with a scanty vegetation. When the limestone is somewhat porous and retentive of water, the flat surfaces of the tops, or even the declivities of the ridges, are covered with prairies. Where the rock is soft and easily dis-aggregated it is mostly covered with trees.

In the eastern part of Fulton County, the ridges, mostly of cherty limestone, are rocky, but, nevertheless, covered with trees of small size: the Mockernut Hickory, the Black Jack and the Post Oak. The top of these ridges is clothed by a luxuriant vegetation of grasses and numerous species of herbaceous plants, thus furnishing a good and abundant pasture for cattle, especially for sheep. A great number of them could be raised in this country. The slopes are gentle and covered with humus, or with a soil of greater fertility than might be supposed from the stunted growth of the trees. It is the Hickory or Mulatto-barren soil, soft, permeable, of a grayish color, producing abundant crops of corn (fifty to sixty bushels to the acre in favorable situations), and especially wheat (twenty-five to thirty-five bushels an acre). The trees naturally growing on this kind of ground are scattered or distant, of the same species as those of the ridges, with the Red, the Black, and the White Oak. The Spanish Oak is also mixed with this vegetation, but it is scarce, and of the remarkable variety *Quercus*

tridentata, Engl. By the form of its leaves and the small size of the tree, this variety would appear as a true species, were it not that westward and in coming to the sandstone it is seen passing by and by into its normal form. The trees become larger, and the three-pointed leaves remain still upon the lowest branches of the tree, while higher up, the other leaves are cut into from four to six long narrow divisions. On the Hickory barrens the trees are generally of a small size, and the forests without underwood,—a phenomenon which may be caused either by the hardness of the rock, which cannot be easily penetrated by the roots, or by fire, which ought to be active on such a rocky light soil.

Between these low cherty ridges the flats or bottoms along the creeks are mostly half prairies, covered with Shrubs, Greenbriers, Indian Currant (in abundance), two species of Sumach, the Kinnikinnik, and the Sassafras. The soil is black, deep, somewhat cold, and clayey (a character showing the nature of its formation by water), and apparently less fertile than the soil of the slopes. It produces, on an average, forty to fifty bushels of corn, and is too compact, too strong for wheat. As these half prairies form the banks of streams, of which the beds are generally deeply cut, it would be easy to drain them, and thus they would be better for agricultural purposes than the upper Mulatto land, because they are formed of the same rocks, have the same elements, and have also a far greater nutritive power.

Between Salem and Benetz Bayou the Subcarboniferous Sandstone crops out and constitutes some hills. Its vegetation shows a difference first in the size of the trees, which become larger and of a more healthy growth. With the Mockernut, the Black Jack and the Post Oak in the most barren places this sandstone has the Chincapin or Dwarf Chestnut, which sometimes descends the declivities to the base of the hills; upon the gentle slopes the Black, the Red, the Scarlet, the White and the Spanish Oak (this last becoming of great size), and the Black Gum which does not like the limestone. The underwood is pretty thick in places, formed of Sumach, Hazel, and especially of the Fackleberry, also a species characteristic of the sandstone. Where the underwood is wanting, three or four species of Bush Clover, a beautiful Blue Gentian (*Gentiana puberula*), three species of Gerardia, some Asters, especially *Diplopappus linariifolius*, and the Dittany, all, except the last, showy and richly-colored flowers, clothe the rocky ground.

Though this sandstone is more favorable for the vegetation of trees than the cherty limestone, the agricultural value of the soil derived from it is far from being as great. The decomposed parts of the rocks, though pulverized and mixed with the decayed remains of plants, preserve their nature of *sand*. Sand being too permeable to water and too dry, the decayed plants scarcely arrive at a point of fermentation necessary to trans-

form them into humus. Thus this soil does not only want the fertilizing elements of the limestone, but the vegetable mould. The healthy growth of the trees on this kind of soil is easily explained by the softness and permeability of the rocks. The roots and rootlets penetrate them, and find humidity and food more easily than in the hard limestone.

The Alluvial formation derived from this sandstone has, like the soil of the ridges, a vegetation somewhat different from the alluvial or bottom land derived from limestone. The alluvial of sandstone has, contrary to that of the ridges, smaller trees than the alluvial of limestone. Its species, which grow close together, are the Birch, the Elm, the Pignut, the Post Oak, the White Oak, the Black Oak, the Chestnut, and the Spanish Oak. On the bottoms derived from limestone, we find especially the Linden, the Buttonwood, the Silver Maple, the Ash-leaved Maple, the Ash, the Honey-Locust, and in the most fertile places the Overcup Oak. The Black, the Red, and the White Oak belong also to this alluvial ground, where they take sometimes an enormous size.

Many species of Oaks and of Hickory are distributed nearly on every kind of soil, as the White, Red, Black Oaks, with the Black Jack and the Post-Oak, and also appear at far different situations. The Black Jack and the Post-Oak are seen upon the barren rocky ridges, whether sandstone or limestone; upon barren declivities, clay, swampy ground, generally showing sterility. The White, Red, and Black Oaks, especially, cover the slopes also on both formations, descend to the bottoms, more or less indicating the value of the soil by the luxuriance of their size and the development of their branches. Nevertheless, we have seen that they thrive well on sandstone, though the soil may be poor for agriculture. It is sometimes very difficult to ascertain the geological nature of an alluvial soil. It may pertain to a limestone formation, though it is mixed with sand; it is the amount of lime dissolved in the water which essentially influences the natural distribution of the plants.

From Benetz Bayou, the limestone and chert are the predominant formations all along our road to the western limits of Carroll County. Thus the bottom land of Benetz Bayou appears very fertile. The Overcup Oak grows on this land. It is a species which we see here in Arkansas for the first time, and which is never found but on fertile alluvial soil. Corn especially, sugar, tobacco, and some little cotton, are cultivated, and grow finely in this part of Benton County, which, like the greatest part of Washington County, appears truly favorable for agriculture. If water could be found near the ridges the land would be far more settled than it is now. It is said that even on the rocky and most barren ridges water is generally found in subterranean springs by boring thirty to forty feet deep. I had no opportunity of ascertaining the truth of this assertion.

The great abundance of grape vines growing in this part of the country,

and the number of species of this genus belonging to Arkansas, the rocky and nevertheless fertile and warm soil of the so-called *Limestone barrens* of Fulton, Carroll, Marion, and other counties, permit the inference that the culture of the grape would be most successful in these counties.* Nevertheless, I have not seen a single grape vine around the farm-buildings. Do the planters consider the grape as a useless accessory to their more substantial food? As a diet, grapes belong to the most wholesome fruits, especially in a warm country, and just at the season when they are ripening. In the hot season of the fall, they do for the body what the bitter sap of the Dandelion, the Cress, and other weeds may do in the spring. They purify the blood and the whole system by their antibilious, febrifuge, and scorbutic properties, and fortify it against the influences of the coming winter. It is a custom for sickly and feeble people of some countries of Southern Europe to go to a grape cure, as we go here to a water-cure establishment. For two or three weeks they eat nothing but full ripe grapes in abundance. Most beneficial results are obtained from this usage. Planting grapes upon the limestone of the counties of North Arkansas would thus at once improve the health of every family, and prepare for the future a more extensive culture for wine-making. Such a culture has become the most remunerative of all on the limestone hills of the Ohio River, which, by the geological nature of the soil, resemble the hills of Arkansas, but of which the climatic situation is far less favorable.

From the top of the Limestone Cliffs of the North Fork of White River, in Fulton County, the view from the hills on both sides of the river is truly beautiful. The country all around looks like an undulating sea of green forests, alternating with small prairies which appear like clearings, or patches of cultivated fields. These high limestone prairies or barrens are now becoming more extensive and more fertile. After passing the North Fork and some woody rocky ridges of cherty limestone we came to the Rap and Talbot barrens, on the eastern boundaries of Marion County.† A part of these barrens are well cultivated, and were, at the time we passed them, covered with fields of corn. Where the soil is thick enough it produces annually forty to fifty bushels of corn an acre, and is good for tobacco. It is about the same kind of soil as that of the half prairies of eastern Fulton. It is also too strong for wheat, and would require to be drained, or at least deeply ploughed, to show its full value. Naturally

* I have seen, in Fulton County, the Muscatine Grape growing finely in the middle of dry rocky beds of the torrents, and also on ridges covered with broken pieces of rock, where no other trace of vegetation was seen.

† See Geology of Marion County, 1st volume of this Report, pages 45 and 224. The difference in the vegetation of the Silurian and of the Subcarboniferous cherty limestone is not appreciable. At least I could not remark any. It may be that a more detailed exploration would permit us to ascertain some species peculiar to each formation.

irrigated every year by water running from the ridges of soft porous limestone, they are continually furnished with the nutritive elements of a rich soil. But even from the richest soil planters cannot expect a full harvest when they are satisfied with scratching the surface a few inches deep before planting their corn and tobacco. The stronger a ground is the deeper it ought to be ploughed.

It would be useless to mention again the names of all the species of plants naturally growing on these prairies, and characteristic of their soil. The catalogue gives sufficient indications of all. In the autumnal months their vegetation becomes remarkably rich in splendid forms and colors. The Compositæ especially, Button-snake Roots, Throughworts, Asters, Golden-rods, Sunflowers, Rosin-plants, with Indian Plantains, Rattlesnake Roots, Hoary Peas, Bush Clover, Gentians, &c. &c., render them as attractive to the eyes as well-cultivated flower gardens would be.

The bottoms of the North and of the Middle Fork of White River are, at the point where we crossed them, narrow but fertile, judging at least from the trees which cover them,—large Buttonwood, Honey Locust, Overcup Oak, and others. The bottoms of Crooked Creek, in Marion County, are also fertile and finely cultivated, like those of Benetz Bayou, producing corn, sugar, tobacco, and cotton. The limestone ridges are also as productive as in Fulton County, and are cultivated whenever they are not too rocky, and especially where they have some water.

In the central part of Marion County, magnesian limestone crops out, and forms higher, more abrupt, and entirely barren ridges. Trees are scarce there. Only a few stunted specimens of the Rock-chestnut Oak, the Juniper, the Persimmon, the Winged Elm, grow in the cracks of humid, decomposing rocks. Some species of herbaceous plants, the Ragweed (*Ambrosia polystachya*), the flocculent and whitish *Croton capitatum*, the pretty *Stenosyphon virgatum*, and the hard and long Beard Grasses, help to cover the barrenness of this formation. These ridges produce nothing. The patches of thin yellow soil, which are here and there attached to places where the water cannot attain them and carry them away, look like half-burnt pieces of brick, which can scarcely be attacked by any kind of vegetation. On the way from Yellville to Carrollton the alternation of high, steep, and sterile hills of the Magnesian Limestone, with low, undulating ridges of fertile Cherty Limestone, shows a remarkable contrast in the vegetation, and consequently in the fertility of both formations. On the same road, the sandstone is also exposed in some places, with the same characteristic vegetation that we have mentioned before. The highest ridges of Marion County are overlaid by Subcarboniferous Sandstone, and sometimes covered with Pines.

Entering Carroll County, we went somewhat out of our direction to visit the Huzza Prairie, which is reported as one of the most fertile parts of the

county. It is underlaid by the Subcarboniferous Limestone, has a deep, grayish soil, which resembles the black mould of some marshes, mixed with a subsoil of loam or argillaceous earth. The fertility of this prairie is due to the great thickness of the soil, to its natural drainage, facilitated by declivities, and perhaps also to a careful culture. The prairie being now nearly all cultivated, and the plants growing on the still unfenced parts of this prairie having been all cut to the root by the browsing of the cattle, I could not observe whether there were any peculiar plants, which could be accepted as characteristic of this soil. But I believe that the original vegetation was just the same as that of the limestone *fertile barrens* of Marion and Fulton counties. Some shrubs, the Sumach, the Persimmon, and the brambles, with the Blue Sage and the Horse Mint, are the only species which could be recognized.

The close browsing of the plants of the prairies around all the farms cultivated, show that these plants, except the too hard grasses and some Compositæ, are pretty good for grazing. From what I have seen of these natural meadows, it is even evident that, when the ground is not too wet, the species of grasses and other plants, like the Clover cultivated for hay, invade the natural prairies, destroying some of the worst grasses, and thus render them ultimately nearly as good for grazing as artificial meadows could be. The manure of cattle has a powerful influence in promoting this transformation. Thus it is most probable that the spreading of liquid manure over the prairies would, after a time, kill the hardest and most useless species of weeds, to let more delicate ones take their place. Another reason why the prairies are invaded by very hard grasses and by coarse plants of the family of the Compositæ is the annual burning of the surface. This process apparently facilitates the growing of spring grass, but it kills the delicate species, which are the best food for cattle. It is the strong, hard, silicious weeds, those which have thick roots, or roots trailing underground or deeply penetrating it, which are left from year to year, and invade the whole space. Salt alone has the property of killing some of the large roots of the Compositæ. Liquid manure contains a good proportion of it; but, generally, in well-managed farms, the active property of this manure is increased by the addition of salt, a small expense, which is repaid tenfold by the excellence of the grass and the richness of the crops.

The formation of the prairies is beautifully exemplified in the woods surrounding Huzza Prairie. This wood, being thick enough (mostly species of oaks and hickory, with an underwood of Sumach, Dogwood, &c.), has here and there round spaces of twenty to one hundred feet in diameter entirely deprived of trees and covered only by the plants of the prairies. In carefully examining these naked places, I always found them to be a little lower than the surrounding forest. They are certainly marshy, and covered with water in the spring.

The prairies of Carrollton County, though reputed as being more fertile than those of Marion and Fulton counties, have nearly the same average produce. When the season is dry, they give no more than thirty-five bushels of corn per acre; in favorable seasons, fifty to sixty bushels. Fifteen bushels of wheat is said to be the average. All the prairies of which the soil is not too compact and clayey, give good crops of oats. Last year (1859), oats were ruined everywhere except on the prairies.

The ridge dividing Crooked Creek from Long Creek is formed of Sub-carboniferous Sandstone. As this sandstone is not cut by any banks of limestone, it afforded me a good opportunity of noting the species of plants pertaining to this formation, and which were not found on the limestone. The number of these species is not great, and they have been marked already. It is especially the Chincapin, the Black Gum, and the Spanish Oak, for the trees, with a greater abundance of the Black Oak, the Scarlet Oak, and the Mockernut. For the shrubs: the Fackleberry, and the species of herbaceous plants enumerated, page 62.

Long Creek has fertile bottoms,—a soil resulting from the decomposition of sandstone, chert, and limestone rocks, alternately exposed along its banks.* It is covered with species of trees characteristic of both limestone and sandstone formations. Thus it has the Black Gum, the Sweet Gum, which I saw there for the first time in Arkansas, and which becomes very common in the sandy bottoms of the south of Arkansas, the Overcup Oak, the Chestnut, the Red, the White, and the Spanish Oaks, the Mockernut, the Elm, &c. The Papaw and the Elder make here also their first appearance, becoming common further south. This land produces, on an average, sixty bushels of corn to the acre, or twenty bushels of wheat. It is not good for oats, but excellent for hay. It is rather light and permeable—a quality which it owes to the detritus of sandstone.

From Long Creek to King's River, along the Bentonville Road, there is a succession of low hills, formed of alternate strata of cherty limestone and of sandstone, which are generally cultivated, except on some of the most rocky and dry places. The highest ridges are still covered with beautiful prairies of the same nature, same fertility, and with the same vegetation as the Huzza Prairie. With the shrubs before mentioned, I find here the bristly Rose Acacia, forming with the Sumach dense thickets, which vary pleasantly the monotony of these plains. It is difficult to account for the difference in the amount of produce between these and the Huzza Prairie. From the reports received, they give, on an average, about thirty-five bushels of corn, or twenty of wheat, per acre. This difference is most probably due to the thinness of the fertile soil in some parts of the prairies of

* Near Carrollton, on one side of the creek, the bank, at its base, is formed of chert, in the middle of hard, compact limestone, and of chert again at the top. On the other side, the base is chert, and the upper part is conglomerate sandstone.

western Carroll County; the woods which border them are entirely rocky, or the ground is nearly a naked chert. This thinness of the ground is unfavorable to the growth of corn, which demands a deep soil, but cannot prevent an abundant growth of grasses or a good crop of hay. Artificial meadows, on these prairies, are very fine.

From Osage Creek to King's River, across a high divide, partly of sandstone, partly of Subcarboniferous cherty limestone, then from King's River up Keel Creek to the head waters of the War Eagle in Madison County, the general appearance of the country is the same as before, and the vegetation does not show any material change. The ridges are barren and dry, when they are high, steep, and narrow; but they are fertile and generally cultivated, when they are low with gentle slopes, and thus keep on their summit or their declivities the decomposed particles of limestone, which, on steep and narrow ridges, are easily washed down by the rain.

The bottoms of Keel Creek, though not cultivated, have a luxuriant vegetation of the species of trees indicating a fertile soil. Even the Papaw grows there, with the Overcup Oak, and, strange to say, with some Pines and Junipers. These last species of trees are brought with the torrents from the top of the highest hills, and become inhabitants of a bottom land contrary to their natural habitation. The declivities along this creek, though steep and rocky, are covered with a great abundance of herbaceous plants, and would furnish good pasture for sheep.

I have already alluded to the fertility of the soil formed from decomposition of Subcarboniferous chert. On the head water of the War Eagle, or of one of its branches, the half-naked, cherty hills have a scant vegetation of Post and Black Jack Oaks, with the Hazel and Ironweed. The ground is so rocky that the soil is hardly seen, except in some coves or depressions. Nevertheless, there are fine and large farms on this kind of ground, and, from inquiries, we heard that the average produce is nearly as good as on the prairies of Fulton and Marion counties. When the season is not too dry, it gives about forty bushels of corn per acre. Wheat is of course an uncertain production on such a rocky soil, but proprietors have raised twenty bushels of it per acre.

In the bottoms of the War Eagle, which are fertile and finely cultivated, I saw, for the first time in Arkansas, the Laurel or Shingle Oak, which, like other species that are very rare in the North, become abundant in the alluvial bottoms of the creeks near the Arkansas River. From here, also, the Pines, which until now were seen on the top of the highest ridges of sandstone, become more abundant, and descend even to the banks and bottoms of the creeks. With the Chestnut, they even appear now on the ridges of cherty limestone, affording apparently a proof of what has been said before: that the compactness of a formation or of a ground influences the distribution of some species, even of those that appear truly

characteristic, more than the chemical nature of the stone. This may be true for a number of species, and is easy to explain; for such trees, like the Pines, receive their food and moisture from the humidity of the atmosphere, and thrive on every soil, provided it is strong enough to fix their roots, and porous enough to give access to atmospheric air. But even among the species of trees there are some of which the distribution cannot be explained in this manner. Thus, the Juniper is peculiar to the limestone, and vegetates as well upon the naked rock as in the loose, alluvial, or dry soil of the hills, when they are derived from limestone. A number of herbaceous plants have, still more than the trees, this disposition to follow a peculiar formation, rather than be ruled in their distribution by purely physical laws. Even considering such species as the Pine, it is not certain at all that secret and purely geological influences have no action in their distribution, although we see them growing upon two as different formations as the cherty limestone and the sandstone. If the amount of silex of the sandstone favors their growth, this chemical principle is still more predominant in the chert. If the Pines follow the ridges all along the Arkansas River, and in Pulaski County cover by themselves hills entirely formed of quartz, we can see there that this quartz is either a metamorphic sandstone, or a peculiar substance which has taken the place of the sandstone, keeping still in its fissures a good deal of the remains or pieces of the original stone. Thus the Pines, though growing there apparently upon the quartz, can still spread their rootlets in its numerous fissures, where fragments of sandstone are still remaining. Moreover, chemically considered, quartz does not differ from flint or chert, and sandstone is mostly a compound of quartz.

The divide between War Eagle and White River is high, steep, and formed of a cherty limestone so porous that it resembles pumice. This rock is of course barren and uncultivated, being entirely deprived of water by percolation. It is covered by the Yellow Pine, the Chincapin, and the Chestnut, the Rock Chestnut Oak, the Black Jack, and the Post Oak, with some of the hardest species of herbaceous plants of the prairies.

From White River, after passing a rocky divide, the road ascends to a high plateau, covered with the far-extended and beautiful prairies of the Osages. They still overlay the cherty Subcarboniferous limestone; in some parts apparently the sandstone; and have the same nature and the same soil as the other prairies of this section. They are flat and of wide extent, and the lowest parts of the surface are marshy and somewhat difficult to drain. In the spring the low grounds are covered by three feet of water. Where the drainage has been attended to, the prairie soil produces, on an average, forty bushels of corn, or fifteen to twenty bushels of wheat an acre, or one thousand to fifteen hundred pounds of tobacco. It gives also fine crops of oats and of hay.

Benton, the county seat, is beautifully situated in the middle of these fertile prairies. From this place, or rather from the western borders of the prairies to the western limits of Arkansas, the country is still the plateau of limestone, broken by numerous creeks, forming narrow valleys or hills, covered with woods and a fertile soil. The vegetation appears to be the same as that of the hills of Fulton, Marion, &c. But it is well to remark here, that the frost has now killed all the herbaceous plants of the prairies, and that henceforth, in our journey, the botanical observations can be pursued but with great disadvantage, and derived only from dry leaves still attached to the trees, or mostly covering the ground.

GEOLOGICAL NATURE OF THE SOIL AND VEGETATION IN WASHINGTON,
CRAWFORD, SEBASTIAN, FRANKLIN, AND JOHNSON COUNTIES.

The true Carboniferous Measures, that is, the sandstone and the shales of the Millstone Grit, with the clay and shales underlying it, are the geological strata from which the elements of the arable soil of these counties is mostly derived. The absence of limestone in the ridges, and the clayey nature of the strata, is at once perceptible in the whitish color of the water of all the creeks which spring from them. In all these counties, the hills or ridges are formed by the Millstone Grit, and consequently their summits are sandy, dry, and sterile, except on somewhat extensive plateaux where water does not find an easy course down the declivities and is retained, moistening the ground by percolating through it. On these flat surfaces only, the soil of the Millstone Grit becomes of sufficient thickness to be arable, and by cultivation is fertile enough. The characteristic trees of this ground are the Yellow Pine, the Spanish Oak, the Black Jack, and Post-Oak, the White, Black, and Red Oaks, the Mockernut, the Chestnut, and the Chincapin, with the Rock Chestnut Oak, the Persimmon, and generally the species of trees and plants which have been mentioned as characteristic of the Subcarboniferous Sandstone.

Near the base of the Millstone Grit, we find thick beds of red shales, covered by flaggy sandstone, and underlaid by beds of clay and black shales, containing sometimes one or two beds of coal. The land extending over these shales is, when flat, transformed into prairies. But, on all the declivities, or where it is cut in hills or undulations by the water-courses, it is covered with a fine growth of trees, viz., the Red, the Scarlet, and the Black Oak, the Yellow Chestnut Oak, the Laurel Oak, the Sweet Gum, Black Gum, Wild Black Cherry, Shellbark Hickory, and other species, some of which have not been found in the upper country, and with the limestone. The red shales form, by their decomposition, what is called the Red-upland, and is considered the most fertile soil of this division. As this

shale is soft, easily penetrated by the roots of the trees, and easily decomposed by atmospheric action, it makes an excellent ground for the growth of the trees, and consequently for the culture of fruit trees. While the north counties of Arkansas scarcely cultivate any fruit, in these western counties nearly every plantation on the red-upland is surrounded by a fine orchard of peach and apple trees.

Most of the too extensive flat lands of this division are prairies, which, underlaid as they are by impermeable beds of shales or of fine clay, are generally marshy. Their soil is too strong, hard, cold, acid, and scarcely cultivated. In Washington County only some of these prairies underlaid by red shales have a soil more permeable to water, and are partly cultivated. South of the Arkansas River, they are used only as natural meadows for cattle raising, and some of them pass to bottom-flats, characterized by some trees,—the Water Oak, the Willow Oak, the Pin Oak, and still the Post-Oak, all species which, except the last, are found also on the deep, fertile bottoms of the rivers.

Around Fayetteville, Washington County, the prairies show the peculiar character of a complex formation, that has been already mentioned, page 57, and described by the Principal Geologist in the first volume of the Report, page 112. The vegetation, as well as can be distinguished now, is nearly the same as that of the high prairies, and still shows the influence of the limestone. The shrubs are the Sumachs, the Hawthorns, the Brambles, and the Winged Elm. Some of the coarsest species of the prairie plants—the Ragweed, the Ironweed, the Basil, the Boneset—grows there in abundance. Part of these prairies are in cultivation. But the best land around Fayetteville is the red-upland, particularly good for the culture of cotton. It gives also fine crops of corn and of wheat; but it is not so good for tobacco.

Around Fayetteville and south of Washington County, through Crawford County to the Arkansas River, the hills are high, steep, and all of Millstone Grit formation. Where the top is flat, or at least unbroken, it is generally cultivated. The soil of the Millstone Grit, though it has no limestone, is richer than could be supposed from the porosity of the sandstone. It is light, sandy, permeable, and produces from twenty-five to thirty bushels of corn, or fifteen to twenty bushels of wheat per acre. It is still better for tobacco, giving, on an average, one thousand pounds per acre.* This soil is soon exhausted, and should be carefully manured. In dry seasons the crop is very short. Good springs are found at the top of the Millstone Grit, even on hills of small extent; but, generally, water is scarce in summer.

* These data were taken at the top of hills five hundred and fifty feet above Mill Creek, a branch of the Middle Fork of White River.

From the banks of White River, where the Shellbark Hickory, the Sweet Gum, the Maple, with the Red, Scarlet, Black, and Spanish Oaks abound, the divide, to the high waters of Lee's Creek, is still a broad ridge of the same formation, nearly six hundred feet above White River. This ridge has some farms on its top. It supports a very luxuriant growth of timber. The trees grow here at an equal distance from each other, just as though they had been planted by hand, raising their straight, large trunks to a height of sixty to eighty feet, and supporting immense pyramids of branches, forming thus an arch of plashing boughs. They are of the same species formerly enumerated, with the addition of the thick Shellbark Hickory, and without any underwood but some shrubs of the Chincapin.

There is also, in some barren places, a shrub much resembling the White Locust. The leaves are of the same form exactly, but the species appears only in tufts of branches growing up from the ground without a trunk. Perhaps this peculiarity is due to the action of the fire destroying the plant every year, and thus forcing it to grow shrubby.

The banks or bottoms of the water-courses, running between these high hills of Millstone Grit, are generally narrower than those which cross the subcarboniferous cherty formations. They are consequently rocky, and do not afford as large fertile plains for agriculture. Nevertheless, clearings and plantations are seen along Lee Creek and other creeks of the northern part of Crawford County.

In the southern part of this county the land becomes flat and the soil more sandy. It is arable, but of middle quality, especially characterized by the Spanish Oak, which there forms by itself whole forests. Between Van Buren and Frog Bayou there are extensive, somewhat marshy, sandy, and argillaceous flats, where this oak constitutes nearly the whole vegetation. Small prairies, apparently barren, enclosed in this forest, are surrounded by a beautiful Hawthorn (*Crataegus spathulatus*), now covered with fruits, and resembling branches of coral. Where the soil is more fertile or less sandy, the Sweet Gum and the Swamp Chestnut Oak replace the Spanish Oak, or are mixed with it. On the banks of the Arkansas River, near Van Buren, the Water Oak (*Quercus aquatica*) makes its first appearance in fine large trees loaded with a prodigious abundance of acorns. It becomes very common in the marshy bottoms of the southern tributaries of the Arkansas River. It even grows, but always shrubby, along the tortuous course of the creeks of the prairies.

A great part of Sebastian and of the south of Franklin County is occupied by prairies underlaid by clay and shales, and still mostly uncultivated. It is impossible to look at the immense and beautiful plains, which are now used only as pastures for cattle, without regretting that agriculture has not until now been able to procure more out of them. They are too wet, too hard, too clayey, say the farmers, who clear land in the forests

surrounding the prairies, where they find a dry, light soil, mostly red upland, or who even prefer settling on the top of the hills of the Millstone Grit. It does not appear that any fair trial of culture has been made on the prairies of this section. By a fair trial, I mean not only the deep ploughing of the subsoil, but the drainage also. The tenacity of the soil may be easily remedied by the addition of manure, and if it is not at hand, of sand, most abundant on all the declivities of the hills surrounding the prairies. Generally, the proprietors know that the soil can be rendered productive; but they find that the result would not repay the cost and trouble. Moreover, the prairies are well enough as excellent pastures for their cattle. These reasons may suffice at present; but when the population of Western Arkansas increases industry will yet derive a great deal more advantage from these plains.

Near the limits of Sebastian and Franklin Counties, between Vache-grasse Creek, Big Creek, and Doctor's Creek, a series of low hills, formed of the red shales, constitutes the water-shed. It is the same red upland as at Lafayette, and it has the same fertility. It is here mostly cultivated for cotton, and has large plantations. Its average produce is one thousand pounds of cotton per acre. For corn it is not quite as good, producing only an average of about thirty bushels an acre; but better for wheat, twenty bushels being the average, and especially for oats. As it receives part of its mineral elements from the Millstone Grit, it is a light, somewhat sandy soil, which, at least from its appearance, cannot preserve for a long time its productive powers. This soil would be much improved by alternation of heavy grains, or of cotton with oats, cultivated only to be turned in as manure.

Grand Prairie of Franklin County is underlaid by ferruginous black shales, or sometimes by the fireclay of the coal. A few low hills are still left in the middle of it, with the original stratification of the measures to which they belong, a succession of shales and fireclay. Some hills like these, but more abrupt and higher, look like Indian mounds, on the flat surface of Long Prairie, in Sebastian County. Neither humidity nor a peculiar nature of the ground can account for the barrenness of these hills, on which there only grows the same species of herbaceous plants as those of the prairies. In a case like this, the growth of trees has probably been prevented by the annual fire of the prairies. There is no possibility to explain the phenomenon in any other manner.

The bottoms of Hurricane Creek, in the southern part of Franklin County, gave us the first insight into the vegetation of the extensive flats or marshy bottoms which border all the rivers in the south of Arkansas. At this place, the characteristic trees are especially the Water Oak, the Willow Oak, which I see for the first time, but which becomes extremely common the more we advance to the southward. Like the former, it grows to a

large size in the flats: the Pin Oak, the Swamp Chestnut Oak, the Laurel Oak, and the Black Jack, with the Sweet Gum, the Buttonwood, a great thickness of underwood, the Papaw, the Arrowwood, the Dogwood, and especially a great quantity of vines; the Bignonia, the Trumpet Flower, the Greenbriers, and, most common of all, the Supple-Jack.

GEOLOGICAL NATURE OF THE SOIL AND VEGETATION ALONG THE ARKANSAS RIVER, IN FRANKLIN, JOHNSON, POPE, CONWAY, AND PART OF PULASKI COUNTIES.

The sandy banks of the Arkansas River, from Roseville, Franklin County, to Little Rock, is characterized by the same trees as the banks of the Mississippi below the mouth of the Ohio River. This bottom, one to two miles broad, has two terraces. The inferior one, or the first bank, as it is sometimes called, has the Cottonwood, the Willows, the Buttonwood, the Silver Maple, the Ash-leaved Maple, the Nettle Tree, and for underwood, the Kinnikinnik. The upper bank, about fifteen feet higher, has the Black Walnut, the Red Oak, the Quercitron, the Pin Oak, the Swamp Chestnut Oak, the Sweet Gum, the Red Mulberry, the Linden, and for underwood, Papaw, Sassafras, Greenbriers, Brambles, Elder Bushes, and Grape Vines. The lower bottom is too sandy and too much exposed to overflows for cultivation; but the upper bottom is fertile, especially cultivated for cotton. It produces, on an average, one bale of cotton, or fifty bushels of corn, per acre.

Our road to Little Rock, on the north side of the river, passes through a hilly country of the Millstone Grit formation. The ground is rocky, mostly covered with the Yellow Pine, and the Black, the White, the Spanish Oaks, and the Black Jack. The hills divide the creeks running to the Arkansas River. Most of the bottoms of these creeks are broad, flat, marshy, with a dense vegetation of Willow, Water, and Pin Oaks. Some prairies also are seen, apparently underlaid by the red carboniferous shales; but they are of small extent.

From Horsehead Creek to Clarksville, Johnson County, the country changes its physical and geological characters. It is marked by a succession of low hills of the red upland or red shales, and is now nearly all cultivated, especially for cotton. These red shales here generally overlie the black shales of the coal at a distance of fifty to one hundred feet. Thus the deepest creeks are cut through the black shales, and all the hills are formed, at least in the upper part, with the red shales. Sometimes they are overlaid by a bed of flaggy sandstone, which, by the erosion of the soft clay under it, descends along the slopes of the hills, following all the irregularities of the ground by breaking in irregular pieces. In places it

looks like a pavement built by hand. This sandy upland, at its junction with sandstone, loses some of its natural fertility. It becomes dry, too permeable, and easily washed, and produces only eight hundred pounds of cotton, or twenty-five bushels of corn, or twelve bushels of wheat, per acre. Its natural vegetation is the Yellow Pine. When this red upland is flat, it becomes marshy, and forms Post-Oak or grassy flats. They are somewhat extensive along the Spadra Creek, near its mouth. When they can be drained, they give one of the best soils of the country. Thus, at the mouth of the same Spadra Creek, this drained land produces annually from sixteen hundred to two thousand pounds of cotton.

The bottoms of both branches of Piney Creek and of its tributaries, like those of Illinois Bayou, Point-Remove Creek, Cadron, and Alarm Bayou, are generally broad, fertile, and well cultivated, when they are not too wet or marshy. The soil is like that of the Spadra Creek bottoms, a black, deep mould, of the same fertility. The extensive flats of this country, and even the flats and Cypress Swamps of Point-Remove Creek, could be gained for agriculture by a systematic drainage, somewhat costly, it is true. It would be necessary to dig, around a marked area, deep trenches, and to heap the materials along these ditches, like dams around the land, which is thus drained and preserved against the inundations. This system, called the Dutch drainage, because it has not only fertilized a great part of Holland, but reclaimed the land from the sea, has been tried with great advantage along the banks of the Mississippi. I have seen it also attempted in a small way on the banks of the Washita River. The comparison given hereafter of the agricultural produce of this reclaimed soil with that of the dry alluvial upland, will put in full evidence the value of the drainage of the low lands of Arkansas. It is true to assert that the greatest riches of the State still lie buried in the mud of its marshes.

The sandstone on the top of Carrion-Crow Mountain already shows evident traces of metamorphism. It has become so hard and compact that it gives fire under the hammer like flint, and is very difficult to break. Nevertheless, the vegetation of the ridge is exactly the same as that of the ridges of sandstone formerly seen. The trees are scarce, but the herbaceous plants cover the whole of the steep and rocky declivity. After crossing Palarm Bayou near its mouth, in Pulaski County, traces of metamorphism become still more evident by the appearance of thin veins of quartz crossing each other in every direction, and apparently filling numerous irregular fissures in the strata of sandstone. Towards Little Rock, the veins of quartz become larger, and after a little, on the other side of Arkansas River, quartz appears to have been entirely substituted for sandstone. But neither on the north nor on the south side of the Arkansas River does the vegetation change its character by this metamorphism of the rocks. The Pines become perhaps more predominant; but the Black

Oak and Black Jack, the White, the Red, and the Spanish Oaks, even the Mockernut, continue to appear mixed with them, just as they are on the hills formed of the Millstone Grit in Crawford County. Only on the quartz barrens these species are stunted or always of small size, as when they cover the cherty limestone of the North. Along the creeks, which run between the hills, or divides, of the metamorphic region of South Pulaski County, the flats or bottoms are also marshy, and have for natural vegetation the Black Jack, the Willow, and the Water Oaks. And the lowest hills formed of the red shales, which appear to have been less influenced by metamorphic agency than the sandstone, preserve with their color and the fertility of their soil the trees which characterize them in the western counties. Between Little Rock and the Hot Springs, the plantations are scarce, and only established on the bottom land of the rivers, when they are not too wet and have not become *flats*.

THE HOT SPRINGS AND HOT SPRINGS COUNTY.

The vegetation of the Hot Springs, which, by constant deposit of their water, have formed a hill of tufa, perforated with the numerous small openings and basins of their water, demands a separate examination. The surface of this calcareous formation is constantly modified, either by erosion of the water running down its steep declivity or by addition of new matter. It is thus nearly barren and naked in some places. Two species of evergreens have invaded this peculiar ground: the Youpon or Cassena (a species generally inhabiting the sandy coasts of the South), and the Juniper. Few other woody plants grow on the hill of the Hot Springs. Only two or three stunted specimens of the Quercitron, of the Ironwood, and a single tree of the Red Maple. Small plants, especially mosses, which are the first plants attacking a naked rock to decompose it and change it into humus, cover most of its surface, especially in places irrigated by the hot water of the springs. The species mentioned here are not interesting in a practical, but remarkable in a scientific point of view, because they show the growth of some of those small plants to be independent of temperature. The most common of all is *Reboullia hemisphaerica* (Rad.), a species of the Liverwort family, and for the mosses, *Bartramia radicalis*, *Bryum argenteum*, *Barbula unguiculata* and *Fissidens taxifolius*. From the family of the Ferns, there is a kind of Maidenhair (*Adiantum Capillus-Veneris* L. and *Cheilanthes Alabamensis*), and from the Phænogamous herbaceous plants, the Wild Senna, the Three-leaved Stonecrop, the Lyre-leaved Sage, the great Lobelia, and *Herpestis nigrescens*, all plants growing so near the hot water of the springs that their roots necessarily are immersed in it. More removed from the influence of the hot water, the French Mulberry, the

Ironweed, the Wild Bergamot and some Greenbrier, vegetate upon the tufa. In the basins which receive the water at the outlets of the springs, three species of Confervæ or green filaments are found attached to stones, leaves, or pieces of decayed wood, or investing the woody pipes which carry the water to the bath-houses.

From the Hot Springs to the southwest of the county toward Magnet Cove, the nature of the rocks is changed to a granitic formation, but the vegetation preserves the same character as it had on the quartz, or on the metamorphic sandstone. The banks of the creek which traverses Magnet Cove have the Hornbeam and the Ironwood, with a few Oaks and trees of the Buttonwood. Where they become flat and marshy, they are overgrown by the Water and the Willow Oaks. The low hills and bottoms of the cove are formed of a reddish ferruginous clay, a true iron ore which makes a soil of greater fertility than would be supposed from its rocky barren appearance. It produces, on an average, fifteen hundred pounds of cotton, or fifty bushels of corn, or twenty bushels of wheat, per acre. This soil covers only a small area. From the cove to Rockport, the country is broken by steep, rocky hills, successively exposing the rocks which are passed from the springs, but in a different order, viz., granite, quartz, and then sandstone. Near Rockport, the tops of the sandstone ridges are cultivated. But here we reach the alluvial formations of the Washita River, sand, pebbles, &c., resembling drift, which have been carried by water to a height of about two hundred feet above the actual bed of the river.

GEOLOGICAL NATURE OF THE SOIL AND VEGETATION OF WASHITA RIVER, AND OF CLARK AND DALLAS COUNTIES.

This part of our exploration was not extended far, while the snow soon forced us to abandon the field. Nevertheless, from the identity of geological formations and of physical circumstances in the southern counties of Arkansas, these remarks are probably applicable to the whole region south and east of Hot Springs County, including the cretaceous, tertiary and alluvial formations of the State.

On account of the nature of the soil and of its natural vegetation, the area occupied by these recent formations can be divided into two well characterized sections. 1st. The upland, covered either by a sandy alluvial ground or by red, sandy, sometimes clayey soil, resulting from the decomposition of red tertiary shales, or of sandstone or clay beds of the same formation. 2d. The deep alluvial soil of the bottom lands, or the low swampy ground bordering the rivers and the creeks.

In passing from the old formations of the coal epoch to the recent tertiary and alluvial, the change in the vegetation is marked at once by

the appearance of the Beech, below Rockport, on the banks of the Washita River. It continues southward, becoming more and more common, till it is the prevailing species, or even covers by itself alone low hills of the tertiary or of the cretaceous formations. As not a single Beech tree has been seen either upon the Silurian and subcarboniferous formations of the north, or upon the Millstone Grit and carboniferous strata of the west of Arkansas, this species, at this low latitude, can be admitted as a true characteristic of the tertiary. It could even be considered as a remnant of the vegetation flourishing at the epoch when the tertiary strata were deposited, as its petrified remains, fruit and leaves, are found mixed with the shales of this formation. It is especially upon the red tertiary upland that the Beech flourishes and attains its greatest size. The yellow sandy uplands, mostly derived from tertiary or cretaceous sandstone, are characterized by the Loblolly Pine, which, with the Yellow Pine, grows also upon the alluvial sandy deposits of the rivers, and even descends to their swampy banks. With these trees are seen, upon all the dry uplands and recent formations, the White, the Black, the Spanish Oaks in abundance and of beautiful growth, more rarely, the Shellbark Hickory, the Black Jack and the Post Oak, with the Holly. These three last species, and occasionally the Beech, inhabit also the marshy bottoms of the rivers.

The fertility of the upland soil, both of the alluvial and of the tertiary formation, is the same. This soil is sandy, too light, easily cut in ravines, and carried down the declivities. Its average produce is about eight hundred pounds of cotton, or fifteen bushels of corn, or eight to ten bushels of wheat, to the acre. That cannot be considered encouraging for agriculture. This soil wants the clay substratum of the subconglomerate prairies, or the detritus of the cherty limestone, or what would be equally favorable, a good dressing of animal manure.

The bottom land of Washita River and of the rivers of this section, is covered by a very rich and luxuriant vegetation. The trees, especially the Red and Pin Oaks, the Swamp Chestnut Oak, the Swamp White Oak, the Willow and Water Oak, even the Beech, become there of enormous size. Other species are less abundant: the Overcup Oak (*Quercus lyrata*), which I have not seen elsewhere, the Pecan-nut, the Shellbark Hickory, the Butternut, the Sweet Gum, the Small Laurel Magnolia, with a thick underwood of the Holly, the Sweetleaf (both very abundant), the Wax Myrtle, the Benzoin, two species of Arrow-wood, plenty of Vines, Gelsemium, Greenbriers, Supple-Jack, Grapes and the Cane. The deepest part of the marshy bottoms have the great Tupelo and the Bald Cypress.

Like the bottoms of the Arkansas River, the banks of all these water-courses have two terraces or two levels: the sandy upper bottoms, which have the vegetation and the productive power of the tertiary and alluvial uplands, averaging for their produce eight hundred pounds of cotton, or

twenty bushels of corn, or ten bushels of wheat an acre. The low bottoms or true bottoms, as they are generally called, are exposed to inundation; but when they can be cultivated, produce, annually, eighteen hundred pounds of cotton, or seventy to eighty bushels of corn. Of course wheat cannot be raised on this soil.

Would it not be well for the proprietors of these apparently uncultivable bottoms, to ponder and compare the difference in the results of agricultural pursuit upon the poor upland soil which they cultivate, and the rich lowland which they leave untouched and useless? The difficulties attending the drainage are great indeed; but the cost of digging trenches and building dams would be richly and tenfold repaid.

It would have been well to mention with each of the geological formations of the State a greater number of botanical species as characteristic of the soil. But this examination is already too long, and the following catalogue of the plants naturally growing in Arkansas, indicating the geological and physical relations of each species, as far as they could be ascertained, may supply the deficiency of the general remarks. This catalogue is not the result of my own labor only. Indeed, if I had only quoted the species of plants which I have found myself, the enumeration would have been very incomplete. Dr. D. D. Owen, the Principal Geologist, and Professor E. T. Cox, who visited some counties of Arkansas during the spring, collected many species of plants, which were given me for determination. The species growing in the fall were collected by myself. But by far the greatest number of plants ever collected in Arkansas were seen and published by the celebrated botanist, Nuttall, who, about twenty years ago, spent much time in exploring Arkansas and the western plains. The results of his explorations were at various times published in the memoirs of scientific societies, especially those of the Academy of Sciences of Philadelphia, which are scarcely attainable now. Thus, I considered it a service rendered to science, to mention in this catalogue all the species seen by Nuttall, and which did not come under my examination. These species of Nuttall are marked in the catalogue by a *.

A glance at the amount of practical information, for medicinal, agricultural, and even mechanical purposes, that can be derived from a catalogue of plants like this, will suffice to show the reason of its place in the reports of a State Geological Survey. There is not a farmer, whatever his circumstances are, that would not be benefited by applying the plants to his use, according to their various properties. It is true that, generally, plants, even the most common, are unknown to the inhabitants of the country, and that English names, or popular descriptions, cannot give sufficient indications to direct them to the true species. But if a science be unknown to many, that is no reason to consider it worthless. The only good way to make people acquainted with the useful and the dangerous plants,

would be to direct every botanical surveyor to collect at least twenty-five specimens of each interesting species. With these specimens a number of collections could be formed and deposited either in normal schools or in the academies of the State or in public libraries, in places accessible to teachers. By examining the plants and reading labels bearing the names, habitat, and property of each species, the teacher would be able to know, in a short time, the valuable plants, and to make them known to his pupils.

It is customary to judge everything from the amount of money that it costs and that it brings. In cases like this, knowledge is equivalent to an unappreciable amount of money. If we could compute the sum that is paid every year by the population of a State like Arkansas for useless, dangerous, poisonous drugs, sold everywhere as popular medicines,—drugs which have taken the hard earnings of the poor, destroyed the health of many, killed thousands of people, and cured nobody,—how enormous this sum would appear! Nobody complains, nevertheless. But when scientific researches introduced among the population can give to every one simple directions for the preservation of health, and indicate valuable medicines for cases of sickness, how many there are who, looking to the cost only, consider these researches as useless and too expensive. Acquaintance with the plants and their properties is advantageous to every one; but becomes a necessity for the inhabitants of the country, where cattle, negroes and children are exposed to die without any rational assistance, when the means of saving them are just at hand, contained in some unknown plant.

A CATALOGUE OF THE PLANTS OF ARKANSAS.¹

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Ranunculaceæ.² Crowfoot Family.			
<i>Clematis</i> , L.,	Virgin-Bower.		
<i>C. ochroleuca</i> , Ait.,		Sandstone,	Rocky creeks.
<i>C. Pitcheri</i> , Tor. & Gr.,		Limestone,	Banks and prairies.
<i>C. Virginiana</i> , L., ³	Common Virgin-Bower,	Limestone,	Woods and thickets.
<i>Anemone</i> , L.,	Windflower.		
? <i>A. Caroliniana</i> , Walt., ⁴			
<i>A. Virginiana</i> , L.,	Tall anemone,		Prairies and open woods.
<i>Hepatica</i> , Dill.,	Liver-leaf.		
<i>H. acutiloba</i> , D C.,		Limestone,	Shady woods.
<i>Thalictrum</i> , Tourn.,	Meadow-Rue.		
? <i>T. anemonoides</i> , Mich.,	Rue-Anemone,		Prairies.
<i>T. Cornuti</i> , L.,	Meadow-Rue,		Wet prairies.
<i>Ranunculus</i> , L.,	Crowfoot.		
<i>R. Purshii</i> , Rich.,	Yellow water Crowfoot,		Mammoth springs.
? <i>R. abortivus</i> , L.,	Small flowered Crowfoot,		Prairies.
? <i>R. Pennsylvanicus</i> , L.,	Bristly Crowfoot,		Damp woods and bottoms.
<i>R. repens</i> , L.,	Creeping Crowfoot,		Marshes.
? <i>R. parviflorus</i> , L.,			"
<i>Myosurus</i> , Dill.,	Mouse-Tail.		
* <i>M. minimus</i> , L.,		Alluvial,	Fields.
<i>Isopyrum</i> , L.			
* <i>I. biternatum</i> , T. & Gr.,		Alluvial,	Moist shady places.
<i>Caltha</i> , L.,	Marsh Marigold.		
<i>C. palustris</i> , L., ⁵		Limestone,	Springs.

¹ The English names of this Catalogue are taken from Prof. Asa Gray's Manual of the Botany of the United States. The order of enumeration is also taken from the same excellent book. The properties of the plants are indicated from such authorities as Haller, Barton, De Candolle, &c.

² Herbs or climbing shrubs, with an acrid and caustic juice sometimes poisonous, but mostly destroyed by heat in drying or cooking the plants.

³ Climbing shrub with white small flowers and carpels or fruits conspicuously feathery. A plant with very acrid juice, to which the milk sickness has been sometimes ascribed.

⁴ Species marked with a ? have not been seen in Arkansas, but are supposed to be there.

⁵ Plant acrid and dangerous when green; but eaten boiled as *greens*. Sometimes named Cowslips. Easily known by its shining bright yellow large flowers and its kidney-shaped leaves. Generally grows in water, the first flower in the spring.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Aquilegia</i> , Tourn., .	. Columbine.		
A. <i>Canadensis</i> , L., .	. . . . .	Limestone, .	Rocky and shady banks.
<i>Delphinium</i> , Tourn.,	. Larkspur.		
D. <i>tricornis</i> , Mich., .	. Dwarf Larkspur, .	Sandy, . .	Damp woods.
D. <i>azureum</i> , Mich., .	. . . . .	Alluvial, . .	Prairies.
*D. <i>virescens</i> , Nutt.,	. . . . .	. . . . .	"
<i>Hydrastis</i> , L., .	. Yellow Puccoon. ¹		
*H. <i>Canadensis</i> , L., .	. . . . .	. . . . .	Woods and banks.
<i>Actæa</i> , L., . . . .	. Baneberry.		
*A. <i>Americana</i> , Pursh., ²	. . . . .	Lime soil, .	Rich woods.
<i>Cimicifuga</i> , L., . .	. Bugbane.		
C. <i>racemosa</i> , Ell, ³ .	. Blacksnake root, .	Limestone, .	Woods and hills.

Magnoliaceæ.

<i>Magnolia</i> , L.			
M. <i>glauca</i> , L., ⁴ . .	. Small Laurel Magnolia,	Alluvial, . .	Deep swamps and bottoms.

Annonaceæ. Custard-Apple Family.

<i>Asimina</i> , Adam, . .	. Papaw.		
A. <i>triloba</i> , Dun., ⁵ . .	. . . . .	Alluvial limestone,	Banks and rich bottoms.
<i>Cocculus</i> , D C.			
*C. <i>Carolinus</i> , D C., . .	. . . . .	Alluvial, . .	River banks, climbing.

Menispermæ.

<i>Menispermum</i> , L, . .	. Moonseed.		
M. <i>Canadense</i> , L., . . . .	. . . . .	Alluvial, . .	Banks.
M. <i>Lyoni</i> , Pursh., . . . .	. . . . .	" . . . .	"

Berberidaceæ.

<i>Jeffersonia</i> , Bart., . .	. Twin leaf.		
? J. <i>diphylla</i> , Pers., . . . .	. . . . .	Limestone, .	Woods.
<i>Podophyllum</i> , L., . . . .	. May-Apple.		
P. <i>peltatum</i> , ⁶ . . . . .	. . . . .	. . . . .	Woods and meadows.

¹ The same name with that of Yellow-Root, is given also to *Zanthoriza opifolia*, L'Her., which also probably grows in Arkansas. The roots of both species are bitter and tonic, employed also for dyeing yellow. The color is not fast.

² Both varieties with red and white fruits, sometimes named *Necklace weed*, are found in Arkansas. Fruit beautiful, in grapes, poisonous. Root bitter, employed as astringent for gargarisms.

³ Has a long (one to two feet) raceme of white flowers successively opening from the base up, and black round sessile fruits. The decoction of the root is a useful family medicine in cases of rheumatism, dropsy, and especially of the St. Vitus dance.

⁴ I have not seen any other species of *Magnolia* in Arkansas. Its aromatic fruit, infused in brandy, is employed as a remedy for Rheumatism. Its bark is said to be as good as that of the *Cinchona* against intermittent fevers. Wood scarcely used, good for joiners' tools.

⁵ Fruit edible, can be much improved by cultivation.

⁶ Fruit edible, not purgative. A light decoction of it in milk serves to alleviate the cough of the consumptives. Leaves poisonous.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Nympheaceæ and Nelumbiaceæ.¹			
<i>Nelumbium</i> , Juss., .	Nelumbo. Sacred-bean.		
<i>N. luteum</i> , Willd., ²	. . . . .	. . . . .	Ponds along the Mississip.
<i>Nymphaea</i> , Tourn.,	Water-Lily.		
<i>N. odorata</i> , Ait, .	. . . . .	. . . . .	Ponds and deep swamps.
<i>Nuphar</i> , Sm., .	Pond-Lily.		
<i>N. advena</i> , Ait., .	. . . . .	. . . . .	Bayous and slow streams.
Sarraceniaceæ. Pitcher-Plants.			
<i>Sarracenia</i> , Tourn., ³	Huntsman's cup.		
? <i>S. rubra</i> , Walt., .	. . . . .	. . . . .	Marshes.
Papaveraceæ. Poppy Family.			
<i>Stylophorum</i> , Nutt.,	Celandine-Poppy.		
<i>S. diphyllum</i> , Nutt ,	. . . . .	Limestone,	Shady woods.
<i>Sanguinaria</i> , Dill.,	Blood-root. ⁴		
* <i>S. Canadensis</i> , L,	. . . . .	Light soil,	Open woods.
Fumariaceæ. Fumitory Family.			
<i>Corydalis</i> , D C.			
* <i>C. aurea</i> , Willd., .	. . . . .	Sandstone,	Rocky woods.
Cruciferæ.⁵ Mustard Family.			
<i>Cheiranthus</i> , R. Br.			
* <i>C. hesperidoides</i> , T. & Gr.,	. . . . .	Alluvial, .	Banks of rivers.
<i>Nasturtium</i> , R. Br.,	Water cress.		
* <i>N. tanacetifolium</i> , H. & A.,	. . . . .	Alluvial, .	Damp soil.
* <i>N. sinuatum</i> , Nutt.,	. . . . .	. . . . .	Banks.
<i>N. officinale</i> , R. Br.,	Water-cress, .	Limestone,	Mammoth Springs. ⁶
? <i>N. palustre</i> , D C.,	Marsh cress, .	. . . . .	Streams.
<i>Streptanthus</i> , Nutt.			
* <i>S. obtusifolius</i> , Hook.,	. . . . .	Limestone,	Hot Springs.
* <i>S. maculatus</i> , Nutt.,	. . . . .	. . . . .	Rocks.
<i>Dentaria</i> , L.,	Pepper-root.		
? <i>D. laciniata</i> , Muhl ,	. . . . .	Alluvial, .	Shady banks.

¹ Water plants, with large floating leaves and white odorous or yellow flowers. Roots farinaceous, sometimes used for food. ² Tubers and seeds eatable.

³ No species of this genus is mentioned by the authors as found in Arkansas. I have seen none. But some ought to be found in the marshes of the sunk country.

⁴ Root used as vermifuge, emetic and purgative. Given especially to horses to destroy Bots. A well-known plant with large white flowers appearing before the leaves in the first spring. Root with a blood-red juice.

⁵ Species of this family have generally an acrid or bitter sap, either concentrated in the seeds as in the mustard, or distributed in the leaves as in the water-cress, or in the roots as in the Horse-Radish. This sap is stimulant and anti-scorbutic. No dangerous principle is found in any species of this useful family, which includes the Cabbage, the Turnip, and some of our finest garden-flowers.

⁶ Probably introduced by Indians with the Mint.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Cardamine</i> , L., . . .	Bitter cress.		
? <i>C. rhomboidea</i> , D C.,		Alluvial, . . .	Marshy bottoms.
* <i>C. hirsuta</i> , L.,		Limestone, . . .	Wet places and rocks.
* <i>C. Ludoviciana</i> , Hook.			
<i>Arabis</i> , L.,	Rock cress.		
<i>A. hirsuta</i> , Scop.,		Limestone, . . .	Rocks.
<i>A. lævigata</i> , D C.,		"	"
<i>A. Canadensis</i> , L.,		"	"
<i>Lævenworthia</i> , Torr.			
* <i>L. aurea</i> , Por.,			Wet places.
<i>Erysimum</i> , L.,	Treacle-Mustard.		
* <i>E. cheiranthoides</i> , L.,	Worm-Mustard, . . .	Limestone, . . .	Along streams.
* <i>E. Arkansanum</i> , Nutt.,	Western Wallflower,	"	Open plains and banks.
<i>Sisymbrium</i> , All.,	Hedge-Mustard.		
* <i>S. canescens</i> , Nutt.,	Tansy-Mustard,		Dry open plains.
<i>Selenia</i> , Nutt.			
* <i>S. aurea</i> , Nutt.,			Wet prairies.
<i>Draba</i> , L.,	Whitlow grass.		
* <i>D. cuneifolia</i> , Nutt.,			Grassy places.
* <i>D. Caroliniana</i> , Walt.,		Sandstone, . . .	Sandy fields.
* <i>D. micrantha</i> , Nutt., . . . . .		. . . . .	Rocky places.
<i>Vesicaria</i> , Lam.,	Bladder pod.		
* <i>V. repanda</i> , Nutt.,			Banks of Red River.
* <i>V. angustifolia</i> , Nutt.,			Prairies.
* <i>V. Nuttallii</i> , T. & Gr.,			"
<i>Capsella</i> , Vent.			
<i>C. bursa-pastoris</i> , M.,	Shepherd's purse,		Waste fields. Introduced.
<i>Lepidium</i> , L.,	Pepper-grass.		
<i>L. Virginicum</i> , L.,		Sand,	Fields and roads.
<i>Senebiera</i> , D C.,	Swine cress.		
* <i>S. didyma</i> , Pers.,			Fields and banks.

Capparidaceæ.¹ *Caper Family.*

<i>Cleomella</i> , D C.			
* <i>C. Mexicana</i> , D C.			
<i>Cleome</i> , L.			
* <i>C. serrulata</i> , Pursh,		Sand,	Banks of Arkansas River.
<i>Polanisia</i> , Raf.			
<i>P. graveolens</i> , Raf.,		Limestone, . . .	Gravelly banks, &c.
<i>Cristatella</i> , Nutt.			
* <i>C. erosa</i> , Nutt.,		Sandstone, . . .	Hills of Red River.
* <i>C. Jamesii</i> , T. & Gr.,		"	" "

Violaceæ.² *Violet Family.*

<i>Solea</i> , D C.,	Green Violet.		
* <i>S. concolor</i> , Gin.,			Thickets.

¹ Same properties as the former family.

² Roots somewhat emetic. Leaves and stems employed as cataplasms in diseases of the skin.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Viola</i> , L., . . .	. Violet.		
<i>V. pedata</i> , L., . . .	. Bird-foot Violet, . . .	Sandstone,	. Rocky prairies.
<i>V. palmata</i> , L., . . .	. Hand-leaf Violet, . . .	" . . .	. Shady places.
<i>V. cucullata</i> , Ait., . . .	. Common blue Violet,	. . . .	. Open woods and hills.
<i>V. sagittata</i> , Ait., . . .	. Arrow-leaved Violet,	Sandstone,	. Woody hills.
<i>V. hastata</i> , Mich., . . .	. Halbert-leaved Violet,	" . . .	" "
* <i>V. tricolor</i> , L., . . .	. Pansy, . . . . .	. . . .	. Fields and dry hills.
<i>Ionidium</i> , Vent.			
* <i>I. stipulaceum</i> , Nutt.,		Sandy, . . .	. Plains of Red River.

Cistaceæ. *Rock-Rose Family.*

<i>Helianthemum</i> , Tour., . . .	. Rock-rose.		
? <i>H. Canadense</i> , Mich., . . . . .	. Frost weed,	Sandstone,	. Dry soil and rocks.
* <i>H. polifolium</i> , T. & Gr.,		Sandy, . . .	. Dry sterile places.
<i>Lechea</i> , L., . . . . .	. Pinweed.		
<i>L. major</i> , Mich.,		Sand and chert,	. Dry woods.
<i>L. minor</i> , Lam., . . . . .		" . . . . .	. Sterile places. Hills.

Droseraceæ.¹ *Sundew Family.*

<i>Drosera</i> , L., . . . . .	. Sundew.		
? <i>D. rotundifolia</i> , L, . . . . .			. Bogs.

Parnassieæ.

<i>Parnassia</i> , Tourn., . . . . .	. Grass of Parnassus.		
<i>P. Caroliniana</i> , Mich.,		Limestone,	. Mammoth Spring.

Hypericaceæ.² *St. John's wort Family.*

<i>Ascyrum</i> , L., . . . . .	. St. Peter's wort.		
<i>A. Crux-Andree</i> , L, . . . . .	. St. Andrew's cross,	Sandstone,	. Pine woods.
<i>Hypericum</i> , L., . . . . .	. St. John's wort.		
<i>H. prolificum</i> , L.,		Sandstone,	. Shady, rocky banks.
<i>H. adpressum</i> , Bart., . . . . .		. . . . .	. Wet prairies.
<i>H. corymbosum</i> , Muhl., . . . . .		. . . . .	. Woods and meadows.
<i>H. nudiflorum</i> , Mich., . . . . .		. . . . .	. Borders of swamps.
<i>H. mutilum</i> , L.,		Limestone,	. Banks and prairies.
<i>H. Canadense</i> , L.,		Sandy, . . .	. Roads on prairies.
* <i>H. Drummondii</i> , T. & Gr.			
<i>Elodea</i> , Pursh., . . . . .	. Marsh St. John's wort.		
* <i>E. petiolata</i> , Pursh., . . . . .			. Swamps.

¹ No species of this family has been mentioned in Arkansas. But probably they have escaped observation. These small plants grow among mosses (*Sphagnum*) in bogs.

² The sap of these plants is generally bitter, astringent and febrifuge.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Caryophyllaceæ.¹ Pink Family.			
<i>Saponaria</i> , L., . . .	Soapwort.		
<i>S. officinalis</i> , L., . . .			Roadsides. Introduced.
<i>Silene</i> , L., . . .	Catchfly.		
* <i>S. stellata</i> , Ait., . . .	Starry Campion,	Sandstone,	Dry woods.
<i>S. antirrhina</i> , L., . . .	Sleepy Catchfly,	" . . .	" "
? <i>S. Virginica</i> , L., . . .	Fire Pink,	. . . . .	Open woods.
<i>Agrostemma</i> , L., . . .	Corn-Cockle.		
<i>A. githago</i> , L., . . .			Wheat fields. Introduced.
<i>Arenaria</i> , L., . . .	Sandwort.		
<i>A. stricta</i> , Mich., . . .		Limestone,	Rocks and barren,
* <i>A. tenella</i> , Nutt., . . .		. . . . .	Rocky places.
* <i>A. Pitcheri</i> , Nutt., . . .		. . . . .	Prairies.
<i>Stellaria</i> , L., . . .	Chickweed.		
* <i>S. Nuttallii</i> , T. & Gr., . . .		. . . . .	Prairies.
* <i>S. macropetala</i> , T. & Gr.			
? <i>S. lanuginosa</i> , T. & Gr., . . .		. . . . .	Shady places.
<i>Cerastium</i> , L., . . .	Mouse-ear Chickweed.		
<i>C. vulgatum</i> , L., . . .		. . . . .	Waste places. Introduced.
<i>Anychia</i> , Mich., . . .	Forked Chickweed.		
<i>A. dichotoma</i> , Mich., . . .		Limestone,	Sterile rocky ground.
<i>Paronychia</i> , Tourn., . . .	Whitlow-wort.		
<i>P. dichotoma</i> , Nutt., . . .		Limestone,	Rocks.
<i>Mollugo</i> , L., . . .	Indian Chickweed.		
<i>M. verticillata</i> , L., . . .	Carpet-weed,	Sand, . . .	Barren.

Portulacaceæ.² Purslane Family.

<i>Portulaca</i> , L., . . .	Purslane.		
<i>P. oleracea</i> , L., . . .		. . . . .	Cultivated ground. Introd.
* <i>P. pilosa</i> , L., . . .		Sand, . . .	Barren.
<i>Talinum</i> , Adans.			
* <i>T. teretifolium</i> , Pursh., . . .		Limestone,	Naked rocks.
<i>Claytonia</i> , L., . . .	Spring beauty.		
<i>C. Virginica</i> , L., . . .		Alluvial, &c.,	Low rich ground.

Malvaceæ.³ Mallow Family.

<i>Althæa</i> , L., . . .	Marsh Mallow.		
<i>A. officinalis</i> , L., . . .		. . . . .	Gardens.
<i>Malva</i> , L., . . .	Mallow.		
<i>M. rotundifolia</i> , L., . . .	Common Mallow,	. . . . .	Roadsides. Introduced.
* <i>M. papaver</i> , Car., . . .		. . . . .	Prairies.

¹ No particular properties ascribed to plants of this family. The *Saponaria*, soap wort, is used for soap, and sometimes as a wash in syphilitic diseases of the skin.

² Purslane, like the Spring-beauty, are eaten as greens, cooked, or raw for salad.

³ Plants of this family contain a demulcent mucilage used as cataplasm or as emollient drink. The Cacao (*Theobroma*) and the Cotton (*Gossypium herbaceum*) belong to this family.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Callirrhoe</i> , Nutt.			
<i>C. digitata</i> , Nutt.,		Limestone,	Rocky, open places.
* <i>C. pedata</i> , T. & Gr., . . . . .		. . . . .	" "
<i>Gossypium</i> , L.,	Cotton.		
<i>G. herbaceum</i> , L., . . . . .		. . . . .	Cultivated.
<i>Sida</i> , L.			
<i>S. spinosa</i> , L.,		Sand,	Dry sterile places.
<i>Abutilon</i> , Tourn.,	Indian Mallow.		
<i>A. Avicennæ</i> , Gärt.,	Velvet-leaf, . . . . .	. . . . .	Waste places, &c. Introd.

Tiliaceæ.¹ Linden Family.

<i>Tilia</i> , L.,	Basswood.		
<i>T. Americana</i> , L.,		Limestone,	Banks.
? <i>T. alba</i> , Mich., . . . . .		. . . . .	"

Meliaceæ. Bead-Tree Family.

<i>Melia</i> , L.,	Pride of India.		
<i>M. azedarach</i> , L. ²			

Linaceæ.³ Flax Family.

<i>Linum</i> , L.,	Flax.		
<i>L. Virginianum</i> , L.,	Wild flax,	Sandy,	Borders of prairies.
<i>L. perenne</i> , L.,		Limestone,	Prairies.

Oxalidaceæ.⁴ Wood-Sorrel Family.

<i>Oxalis</i> , L.,	Wood sorrel.		
<i>O. violacea</i> , L.,	Violet wood sorrel,	Sandstone,	Rocky woods.
<i>O. stricta</i> , L.,	Yellow wood sorrel, . . . . .	. . . . .	Cultivated ground.

Geraniaceæ. Cranesbill Family.

<i>Geranium</i> , L.,	Cranesbill.		
<i>G. maculatum</i> , L., ⁵	Wild Cranesbill, . . . . .	. . . . .	Thickets and prairies.
? <i>G. Carolinianum</i> , L.,		Sandy,	Barren places.

¹ The plants of this family have nearly the same properties as the Mallows. The bark of the Basswood is used for making ropes and coarse cloth. Its wood is soft, white. The fruit has been prepared for making chocolate. The tea of the flowers an edulcent, cooling, and valuable drink.

² The fruit of this tree, which is cultivated as ornament, is said to be poisonous, though eaten by birds and children. Used as a vermifuge. Its pulp, says Michaux, is good against scurfy sickness. A decoction of the bark as tea is vermifuge and also purgative. Used for intermittent fevers.

³ Plants of this family are known by the use of the fibres of the stems. The seeds of the common Flax (*Linum usitatissimum*, L.) are emollient as cataplasm, and yield a valuable oil. The Cotton has banished the Flax from the Southern States.

⁴ All the species of this family contain a considerable quantity of oxalate of potash, which gives to the plants an agreeable taste and cooling, laxative properties.

⁵ Plant with short, branching stems, leaves cut in three or five divisions, large purplish flower, and long-beaked capsule. Much used as family medicine. Root (collected in autumn) astringent, without bitter taste, useful in diarrhoea, children cholera, loss of blood, stone in the bladder.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Balsaminaceæ.¹ Balsam Family.			
<i>Impatiens</i> , L., . . .	Jewel-weed.		
<i>I. pallida</i> , Nutt., . . .	Pale Touch-me-not,	Limestone,	Mammoth Spring.
? <i>I. fulva</i> , Nutt., . . .	Spotted Touch-me-not,	" . . .	Wet shady places.

Rutaceæ. Rue Family.

<i>Zanthoxylum</i> , Col., ² . . .	Prickly Ash.		
? <i>Z. Americanum</i> , Mill., . . .	" . . .	Limestone,	Rocky places.
*? <i>Z. Carolinianum</i> , N., . . .	" . . .	" . . .	" "
* <i>Z. macrophyllum</i> , Nutt., ³ . . .	" . . .	" . . .	" "
<i>Ptelea</i> , L., . . .	Hop-tree.		
<i>P. trifoliata</i> , L., ⁴ . . .	" . . .	Limestone,	Rocky banks.
<i>Ailanthus</i> , Desf., . . .	Chinese Sumach.		
<i>A. glandulosus</i> , Desf., ⁵ . . .	" . . .	" . . .	Cultivated.

Anacardiaceæ.⁶ Cashew Family.

<i>Rhus</i> , L., . . .	Sumach.		
* <i>R. cotinoides</i> , Nutt., . . .	" . . .	Limestone,	Banks of Grand River.
<i>R. glabra</i> , L., . . .	Smooth Sumach, . . .	" . . .	Rocky, barren places.
<i>R. typhina</i> , L., . . .	Staghorn Sumach, . . .	" . . .	Hillsides and prairies.
<i>R. copallina</i> , L., . . .	Dwarf Sumach, . . .	" . . .	Barren.
? <i>R. venenata</i> , D C., ⁷ . . .	Poison Sumach, . . .	" . . .	Swamps.
<i>R. Toxicodendron</i> , L., ⁸ . . .	Poison Ivy, . . .	Mostly climbing,	Barren and rich land, &c.
<i>R. aromatica</i> , Ait., . . .	Fragrant Sumach, . . .	Limestone,	Rocks and barren.

Vitaceæ. Vine Family.

<i>Vitis</i> , Tour., . . .	Grape.		
* <i>V. bipinnata</i> , T. & Gr., . . .	" . . .	" . . .	Damp, rich bottoms.
* <i>V. incisa</i> , Nutt., . . .	" . . .	" . . .	Prairies and copses.
* <i>V. indivisa</i> , Willd., . . .	" . . .	" . . .	Swamps and bottoms.
<i>V. labrusca</i> , L., . . .	Northern Fox grape,	Limestone,	Moist thickets.
<i>V. aestivalis</i> , Mich., . . .	Summer grape, . . .	Cherty limestone,	Dry rocky places.
* <i>V. cordifolia</i> , Mich., . . .	Frost grape, . . .	" . . .	Thickets along rivers.
* <i>V. riparia</i> , Mich., . . .	" . . .	" . . .	" " "
<i>V. vulpina</i> , L., . . .	Muscadine, . . .	Limestone,	Rocky places.

¹ Fine name, but no valuable property.

² Shrubs with pinnate leaves and prickly stems. Bark bitter, aromatic, causing in the mouth the flow of saliva; used against toothache, paralysis of the tongue and of the muscles of the mouth. Also a sudorific medicine.

³ Nuttall says that this species grows in Arkansas rather than the former.

⁴ Fruit bitter, aromatic, used as a substitute for Hops in the fabrication of beer.

⁵ Fine shade tree, but objectionable on account of the bad odor of the flowers and its disposition to run.

⁶ No American species of this family has any good property. Some species are poisonous.

⁷ Very poisonous. I have not seen it in Arkansas, but people said it was abundant in the swamps.

⁸ Poisonous, like the former, to the touch. Milk sickness is attributed to it in some countries.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Ampelopsis</i> , Mich.,	Virginian creeper.		
<i>A. quinquefolia</i> ,	"	Limestone,	Alluvial in woods.

Rhamnaceæ.¹ *Buckthorn Family.*

<i>Berchemia</i> , Neck.,	Supple Jack.		
<i>B. volubilis</i> , D C.,	"		Damp rich bottoms.
<i>Rhamnus</i> , Tourn.,	Buckthorn.		
? <i>R. lanceolatus</i> , Pursh.,	"	Limestone,	Cliffs.
<i>R. Carolinianus</i> , L.,	Alder Buckthorn,		Barren banks, &c.
<i>Ceanothus</i> , L.,	New Jersey tea.		
<i>C. Americanus</i> , L.,	"	Sandy,	Dry thickets and prairies.
* <i>C. ovalis</i> , Bigel.,	"	"	Rocky places.

Celastraceæ. *Staff tree Family.*

<i>Celastrus</i> , L.,	Staff-tree.		
? <i>C. scandens</i> , L.,	Waxwork,		Thickets.
<i>Euonymus</i> , Tourn., ²	Spindle-tree.		
<i>E. atropurpureus</i> , Jack.,	Burning bush,		Shady places, thickets, &c.
? <i>E. Americanus</i> , L.,	Strawberry bush,		Rocky shady places.

Sapindaceæ. *Soapberry Family.*

<i>Staphylea</i> , L.,	Bladder-nut.		
<i>S. trifolia</i> , L.,	"	Limestone,	Thickets and banks.
<i>Aesculus</i> , L., ³	Buckeye.		
* <i>A. Pavia</i> , L.,	Red Buckeye,	Limestone,	Alluvial soil. Thickets.
? <i>A. flava</i> , Ait.,	Sweet Buckeye,	"	Rich bottoms.
<i>Sapindus</i> , L.,	Soap-berry.		
* <i>S. marginatus</i> , Willd.,	"	Sandy,	Banks of rivers.

Acerineæ. *Maple Family.*

<i>Acer</i> , Tour.,	Maple.		
<i>A. saccharinum</i> , L., ⁴	Sugar maple,	Limestone,	Shady banks.
<i>A. dasycarpum</i> , Ehr., ⁵	Silver maple,	"	and sandy, River banks.
? <i>A. rubrum</i> , L., ⁶	Red maple,	"	alluvial, Swamps and banks.
<i>Negundo</i> , Moen.,	Ash-leaved maple.		
<i>N. aceroides</i> , M., ⁷	"	Lime'one, alluvial,	Low grounds.

¹ Bark and fruit of species of this family are generally purgative, and sometimes vomitive.

² Wood hard, tough, used for spindles, and by watchmakers for cleaning-wood.

³ Fruit abounds in potash and starch. Bark bitter, tonic, good for tanning and dyeing yellow Wood soft.

⁴ Very rare in Arkansas. Wood strong, heavy, not durable, used for cabinet work; slow seasoning.

⁵ Wood white, fine-grained, softer than any other maple.

⁶ Wood fine-grained, light, employed for chairs, stocks of guns, &c. Probably grows in Arkansas.

⁷ Common in Arkansas. Generally in a rich lime soil. Wood fine and even-grained, yellowish veined, used for cabinet-work.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Polygalaceæ. Milkwort Family.			
<i>Polygala</i> , Tour., ¹	Milkwort.		
* <i>P. purpurea</i> , L.,			Wet meadows, prairies.
<i>P. lutea</i> ,		Sand,	Barren.
* <i>P. incarnata</i> , L.,			Dry soil, prairies.
<i>P. verticillata</i> , L.,		Sand,	Fields and barren.
<i>P. fastigiata</i> , Nutt.,			Prairies and barren.
<i>Krameria</i> , Loeffl.,			
* <i>K. lanceolata</i> , Tor.,		Sand,	Barren.

Leguminosæ.² *Fulse Family.*

<i>Lupinus</i> , Tour.,	Lupine.		
? <i>L. villosus</i> , Willd.,		Sand,	Barren.
<i>Crotolaria</i> , L.,	Rattle-box.		
<i>C. sagittalis</i> , L.,		Cherty Limestone,	Barren.
<i>Trifolium</i> , L., ³	Clover.		
<i>T. arvense</i> , L.,	Stone clover,	Sandy,	Fields and barren.
<i>T. pratense</i> , L.,	Red clover,		Cultivated.
<i>T. reflexum</i> , L., ⁴	Buffalo clover,	Alluvial,	Woods and meadows.
<i>T. repens</i> , L.,	White clover,		Old fields.
* <i>T. Carolinianum</i> , Mich., ⁵		Sandy,	Fields.
<i>Hosackia</i> , Doug.			
* <i>Purshiana</i> , Bent.,			Prairies.
<i>Psoralea</i> , L.			
* <i>P. linearifolia</i> , T. & Gr.			
* <i>P. digitata</i> , Nutt.,		Sand,	Hills of Arkansas River.
* <i>P. floribunda</i> , Nutt.,			Prairies.
* <i>P. cryptocarpa</i> , T. & Gr.			
* <i>P. eglandulosa</i> , Ell.,			Dry soil.
* <i>P. simplex</i> , Nutt.,			Plains of Red River.
<i>P. melilotoides</i> , Mich.,		Sand,	Prairies and barren.
<i>Dalea</i> , L.			
* <i>D. laxiflora</i> , Pursh.,			Prairies.
* <i>D. lanuginosa</i> , Nutt.,		Sand,	Banks of Arkansas River.
* <i>D. aurea</i> , Nutt.,			Prairies.
<i>D. alopecuroides</i> , Willd.,		Sand,	Banks.

¹ Roots bitter, astringent, tonic; employed against the bite of snakes, against dysentery, &c. Properties not well known.

² Properties different. Some species are strongly purgative, some vermifuge, most of them nutritive, either for man by the seeds like the beans, or for cattle by the stems and leaves like the clover. Some species give a blue color used for dyeing; some are most useful gums. Gum Arabic, Copabes, Balm of Peru, &c.

³ Some species, especially Red clover, are introduced for cultivation. Benefiting the soil, especially when turned in.

⁴ An American species. Flowers as large as the Red clover. Merits to be tried for cultivation.

⁵ Species of sweet clover (*Melilotus*) and of Lucerne (*Medicago*) are numerous and much cultivated in Europe; but our American climate is too dry for such culture.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Petalostemon</i> , Mich.			
* <i>P. multiflorum</i> , Nutt.,			Prairies.
<i>P. candidum</i> , Mich.,			Dry prairies.
* <i>P. phleoides</i> , T. & Gr.			
<i>P. violaceum</i> , Mich.,		Limestone,	High prairies.
* <i>P. decumbens</i> , Nutt.,			Plains of Red River.
<i>Amorpha</i> , L.,	False Indigo.		
<i>A. fruticosa</i> , L.,		Sandstone,	Rocky creeks.
* <i>A. paniculata</i> , T. & Gr.,			Prairies. ?
* <i>A. canescens</i> , Nutt., ¹	Lead plant,		Dry prairies.
<i>Robinia</i> , L.,	Locust-tree.		
<i>R. Pseudacacia</i> , L., ²	White Locust,	Limestone,	Rocky places and prairies.
<i>R. hispida</i> , L.,		Sandstone,	Dry barren hills.
<i>Sesbania</i> , Pers.			
* <i>S. macrocarpa</i> , Muhl.,			Wet places.
<i>Tephrosia</i> , Pers.,	Hoary Pea.		
<i>T. Virginiana</i> , Pers.,	Goat's Rue,	Sandstone,	Dry barren hills.
* <i>T. onobrychoides</i> , Nutt.,			Plains of Red River.
<i>T. spicata</i> , T. & Gr.,		Sandstone,	Dry barren places.
? <i>T. hispidula</i> , Mich.,		"	"
<i>Glycyrrhiza</i> , Tour.,	Liquorice.		
* <i>G. lepidota</i> , Nutt.,			Banks of rivers.
<i>Indigofera</i> , L.,	Indigo plant.		
* <i>I. leptosepala</i> , Nutt.,			Plains of Arkansas River.
<i>Astragalus</i> , L.,	Milkvetch.		
* <i>A. trichocalyx</i> , Nutt.,			Prairies.
* <i>A. pachycarpus</i> , T. & Gr.,			Prairies.
* <i>A. distortus</i> , Nutt.			"
* <i>A. Nuttallianus</i> , D C.,			"
? <i>A. Canadensis</i> , L.,		Sandy,	Thickets.
? <i>A. Mexicanus</i> , D C.,			Prairies.
<i>Aeschynomene</i> , L.,	Sensitive Joint Vetch.		
<i>A. hispida</i> , Willd.,		Sand,	Plains.
<i>Desmodium</i> , D C.,	Tick Trefoil.		
<i>D. nudiflorum</i> , D C.,		Sandstone,	Rocky woods.
<i>D. acuminatum</i> , D C.,			" "
<i>D. pauciflorum</i> , D C.,			Hilly woods.
<i>D. Canadense</i> , D C.,			Dry woods and prairies.
<i>D. canescens</i> , D C.,			Rich soil, prairies.
* <i>D. cuspidatum</i> , T. & Gr.,			Banks of rivers and roads.
* <i>D. viridiflorum</i> , Beck.,		Alluvial,	Woody bottoms.
* <i>D. rhombifolium</i> , D C.,		"	Dry rich soil.
? <i>D. ciliare</i> , D C.,			Dry hills and copses.
* <i>D. rigidum</i> , D C.,			Open woodland.

¹ Said to grow on lead-bearing rocks. I did not see it in Arkansas.

² Valuable species. Common in Arkansas, but often a shrub. Wood greenish, yellow, brown-veined, fine-grained, strong, resisting decay better than any other wood. Used in naval architecture and in cabinet-work. Much exported to England, but becoming scarce. Leaves excellent food for cattle. Roots sweet-tasted.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>D. sessilifolium</i> , T. & Gr.,	. . . . .	. . . . .	Prairies.
? <i>D. rotundifolium</i> , D C.,	. . . . .	. . . . .	Dry soil.
<i>D. paniculatum</i> , D C.,	. . . . .	. . . . .	Woods and prairies.
<i>Lespedeza</i> , Mich.,	. Bush clover.		
<i>L. procumbens</i> , Mich.,	. . . . .	Chert & Sandstone,	Rocky woods.
<i>L. repens</i> , Bart.,	. . . . .	" "	Dry soil, barren.
<i>L. violacea</i> , Pers.,	. . . . .	Sand,	Woods and thickets.
<i>L. Stuvei</i> , Nutt.,	. . . . .	Limestone,	Barren and hills.
<i>L. hirta</i> , Ell.,	. . . . .	Sandstone, &c.,	Dry rocky prairies.
<i>L. capitata</i> , Mich.,	. . . . .	" "	" "
<i>Stylosanthes</i> , Sw.,	. Pencil flower.		
<i>S. elatior</i> , Sw.,	. . . . .	Sand,	Barren.
<i>Vicia</i> , Tour.,	. Vetch Tare.		
<i>V. Americana</i> , Walt.,	. . . . .	. . . . .	Borders of thickets.
<i>V. Caroliniana</i> , Walt.,	. . . . .	. . . . .	Banks of prairies.
* <i>V. Lævenworthii</i> , T. & Gr.			
* <i>V. micrantha</i> , Nutt.,	. . . . .	. . . . .	Prairies and woods.
<i>Lathyrus</i> , L.,	. Everlasting Pea.		
* <i>L. pusillus</i> , Ell.,	. . . . .	. . . . .	Prairies?
<i>Phaseolus</i> , L.,	. Kidney-Bean.		
? <i>P. perennis</i> , Walt.,	. Wild Bean,	Limestone,	Rocky banks.
* <i>P. leiospermus</i> , T. & Gr.,	. . . . .	. . . . .	Plains.?
<i>Dolichos</i> , L.			
* <i>D. multiflorus</i> , T. & Gr.,	. . . . .	Alluvial,	Banks.
<i>Apios</i> , Boer.,	. Ground-nut.		
<i>A. tuberosa</i> , Moen.,	. . . . .	Alluvial,	Shady fertile soil.
<i>Rhynchosia</i> , D C.,			
<i>R. tomentosa</i> , T. & Gr.,	. . . . .	Sandstone,	Dry open places.
* <i>R. latifolia</i> , Nutt.,	. . . . .	. . . . .	Woods.
<i>Galactia</i> , R. Br.,	. Milk Pea.		
* <i>G. pilosa</i> , T. & Gr.,	. . . . .	Sandstone,	Dry open woods.
<i>Amphicarpaea</i> , Ell.,	. Hog pea-nut.		
<i>A. monoica</i> , Nutt.,	. . . . .	. . . . .	Woodland, thickets.
* <i>A. Pitcheri</i> , T. & Gr.,	. . . . .	. . . . .	Plains of Red River.
<i>Clitoria</i> , L.,	. Butterfly-pea.		
<i>C. Mariana</i> , L.,	. . . . .	Sand?	Dry soil. (M. Cox.)
<i>Baptisia</i> , Vent.,	. False Indigo.		
* <i>B. lanceolata</i> , Ell.,	. . . . .	Sandstone,	Dry rocky soil.
* <i>B. villosa</i> , Ell.			
* <i>B. sphærocarpa</i> , Nutt.,	. . . . .	Alluvial,	Plains.
<i>B. leucophæa</i> , Nutt.,	. . . . .	Sandstone,	Banks of rivers.
* <i>B. australis</i> , R. Br.,	. . . . .	. . . . .	" "
<i>B. leucantha</i> , T. & Gr.,	. . . . .	. . . . .	Rich soil.
<i>Sophora</i> , L.			
* <i>S. affinis</i> , T. & Gr.,	. . . . .	. . . . .	Prairies.
<i>Cercis</i> , L.,	. Red-Bud.		
<i>C. Canadensis</i> , L., ¹	. . . . .	Alluvial,	Rich banks and bottoms.

¹ Common in Arkansas. Wood hard, finely veined, susceptible of good polish. Buds preserved in vinegar for pickles.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Cassia</i> , L., . . .	. Senna.		
<i>C. Marilandica</i> , L., ¹	. Wild Senna.	Alluvial Lime., .	Fat bottoms.
* <i>C. obtusifolia</i> , L., . . .	. . . . .	. . . . .	Dry soil.
<i>C. chamæcrista</i> , L., . . .	. Partridge pea,	Limestone chert,	Sandy and rocky prairies.
<i>Gymnocladus</i> , Lam., . . .	. Coffee-tree.		
<i>G. Canadensis</i> , Lam., ² . . . . .	. . . . .	. . . . .	Banks of rivers.
<i>Gleditschia</i> , L., . . .	. Honey Locust.		
<i>G. triacanthos</i> , L., ³ . . .	. Black Locust,	Limestone,	Rich soil, barren, wet, and [dry bottoms.]
<i>Schrankia</i> , Willd., . . .	. Sensitive Briar.		
<i>S. uncinata</i> , Willd., . . . . .	. . . . .	Sand,	Barren and prairies.
<i>Desmanthus</i> , Willd., . . . . .	. . . . .	
<i>D. brachyloba</i> , D C., . . . . .	. . . . .	Sandy,	Prairies and ban ks.
* <i>D. Jamesii</i> , T. & Gr., . . . . .	. . . . .	. . . . .	Sources of Canadian River.
* <i>D. leptolobus</i> , T. & Gr., . . . . .	. . . . .	. . . . .	Prairies. ?
<i>Acacia</i> , Neck.			
* <i>A. lutea</i> , Lea., . . . . .	. . . . .	. . . . .	Prairies.
* <i>A. hirta</i> , Nutt., . . . . .	. . . . .	. . . . .	Plains of Red River.

Rosaceæ.⁴ *Rose Family.*

<i>Prunus</i> , L., . . . . .	. Plum and Cherry.		
<i>P. Americana</i> , Mart, ⁵ . . . . .	. Wild plum,	Alluvial lime, &c.,	Banks and thickets.
* <i>P. Chicasa</i> , Mich., . . . . .	. Chickasaw plum,		
<i>P. pumila</i> , L., . . . . .	. Dwarf cherry,	Limestone,	Rocky banks.
<i>P. serotina</i> , D C., ⁶ . . . . .	. Wild black cherry,	M. G. and sandst.,	Alluvial woods.
* <i>P. Caroliniana</i> , Mich., . . . . .	. . . . .	Limestone,	Rocky banks.
<i>Spiræa</i> , L., . . . . .	. Meadow sweet.		
<i>S. opulifolia</i> , L., . . . . .	. Nine bark,	Limestone,	Banks and rocky creeks.
* <i>S. aruncus</i> , L., . . . . .	. . . . .	"	Shady and rocky creeks.
<i>Gillenla</i> , Moench, . . . . .	. Indian Physic.		
<i>G. stipulacea</i> , Nutt., ⁷ . . . . .	. American Ipecac,	Sandstone,	Dry sterile soil.

¹ The leaves are very valuable as purgative in intermittent fevers. The plant abounds where the fever is endemic.

² Wood hard, tough, strong, good for building and cabinet-making. Bark very bitter.

³ Wood hard, fifty-two pounds per cubic feet when dry. Difficult to split; not much used, except for fences as sapling. Grows everywhere, but likes limestone soil.

⁴ Plants generally with an astringent principle, which makes some species useful in medicine as febrifuge, or against dysentery. Some have been compared to Cinchona. This principle is found diluted in most of the fruits, apples, pears, cherries, plums, peaches, &c., and renders them most wholesome food in the fall. The kernels of some fruits of this family give by distillation Prussic acid, a violent poison. Useful gums exude from some trees of this most interesting family, which gives us our finest flowers for the garden.

⁵ Is much improved by cultivation. *Prunus spinosa* has been introduced for hedges.

⁶ A large tree, common in Arkansas. Wood compact, fine-grained, susceptible of brilliant polish good for cabinet-work. The bark, branches, and roots have an aromatic taste, and are tonic. The fruit in Brandy is a cordial against fevers.

⁷ Flower white, with erect a little unequal petals. Leaves cut in three, with divisions doubly dentate, with a large stipule at the base. Many properties have been attributed to it without reason. It has a bitter and pungent taste. Always grows on a poor soil.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Agrimonia</i> , Tour., .	. Agrimony.		
? <i>A. Eupatoria</i> , L., .	. . . . .	Limestone,	. Woods and banks.
<i>A. parviflora</i> , Ait., .	. . . . .	" . . . . .	" "
<i>Sanguisorba</i> , L., .	. Great Burnet.		
* <i>S. annua</i> , Nutt., .	. . . . .	. . . . .	. Plains of Red River.
<i>Geum</i> , L., . . . . .	. Avens.		
<i>G. album</i> , Gm., . . . . .	. . . . .	. . . . .	. Prairies. (M. Cox.)
* <i>G. Virginianum</i> , L., . . . . .	. . . . .	Limestone,	. Damp fertile soil.
* <i>G. vernum</i>, . . . . .	. . . . .	" . . . . .	. Woods and thickets.
<i>Potentilla</i> , L., . . . . .	. Cinque foil.		
<i>P. Canadensis</i> , L., . . . . .	. . . . .	Cherty, . . . . .	. Dry prairies.
<i>Fragaria</i> , Tour., . . . . .	. Strawberry.		
<i>F. Virginiana</i> , Ehr., . . . . .	. . . . .	Clayey soil,	. Woods and prairies.
<i>Rubus</i> , L., . . . . .	. Bramble.		
<i>R. villosus</i> , Ait., . . . . .	. High Blackberry,	Alluvial, . . . . .	. Borders of woods and pra.
<i>R. Canadensis</i> , L., . . . . .	. Dewberry,	Sandstone,	. Rocky hills and creeks.
<i>R. trivialis</i> , Mich., . . . . .	. Low Bush-Blackberry,	. . . . .	. Dry soil, barren.
<i>R. cuneifolius</i> , Pursh., . . . . .	. Sand Blackberry,	Sandstone,	. Banks.
<i>Rosa</i> , Tourn., . . . . .	. Rose.		
<i>R. setigera</i> , Mich., . . . . .	. Prairie Rose,	Limestone,	. Banks, prairies, and bott.
<i>R. lucida</i> , Ehr., . . . . .	. Dwarf Rose, . . . . .	" . . . . .	. Margin of swamps.
* <i>R. foliosa</i> , Nutt., . . . . .	. . . . .	. . . . .	. Prairies.
<i>Cratægus</i> , L., ¹ . . . . .	. Hawthorn.		
<i>Crus-galli</i> , L., . . . . .	. . . . .	Limestone,	. Thickets and banks.
<i>C. coccinea</i> , L., . . . . .	. Scarlet Thorn,	" . . . . .	. Thickets. Rocky banks.
<i>C. tomentosa</i> , L., . . . . .	. Pear Thorn, . . . . .	" . . . . .	. Woods & swamps. M. Spg.
<i>C. punctata</i> , Jacq., . . . . .	. . . . .	. . . . .	. Borders of prairies.
<i>C. spathulata</i> , Mich., . . . . .	. . . . .	Limestone & sandy,	Prairies. Mam. Springs.
* <i>C. æstivalis</i> , Tor. & Gr., . . . . .	. . . . .	. . . . .	. Low wet banks.
<i>C. flava</i> , Ait., . . . . .	. Summer haw,	Sandy, . . . . .	. Prairies.
? <i>C. parvifolia</i> , Ait., . . . . .	. Dwarf thorn, . . . . .	" . . . . .	. Dry soil.
<i>Pyrus</i> , L., . . . . .	. Pear-apple.		
? <i>P. coronaria</i> , L., ² . . . . .	. Crab-apple,	Limestone,	. Borders of woods.
? <i>P. angustifolia</i> , Ait. ³			
<i>P. arbutifolia</i> , L., . . . . .	. Chokeberry,	Sandstone,	. Cliffs.
<i>Amelanchier</i> , T. & Gr., . . . . .	. Juneberry.		
? <i>A. Canadensis</i> , T. & Gr., Shad Bush, . . . . .	. . . . .	Sandstone,	. Swampy ground, springs, and dry rocky places.

Calycanthaceæ. *Allspice Family.*

<i>Calycanthus</i> , L., . . . . .	. Carolina Allspice.		
? <i>C. floridus</i> , L., ⁴ . . . . .	. . . . .	Sandstone,	. Rocky hills, &c.

¹ The best species for hedges is *Cratægus oxyacantha*, L., introduced from Europe.

² I did not see this species on our way through Arkansas, but heard that it was in plenty around the Northern prairies.

³ Resembles the former, and is often confounded with it.

⁴ I did not see it in Arkansas, but on the southern limits of Missouri near Arkansas.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
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Melastomaceæ.

<i>Rhexia</i> , L., . . .	Deer-grass.		
* <i>R. Virginica</i> , L., . . .		Sandy, . . .	Moist places.

Lythraceæ. Loosestrife Family.

<i>Hypobrichia</i> , Curt.			
* <i>H. Nuttallii</i> , T. & Gr.,			Slow streams, ponds.
<i>Ammannia</i> , Houst.			
* <i>A. latifolia</i> , L.,			Wet places.
<i>Lythrum</i> , L.,	Loosestrife.		
<i>L. alatum</i> , Pursh.,			Wet prairies.
<i>Decodon</i> , Gmel.			
? <i>D. verticillatum</i> , Gm.,			Swamps of Mississ. River.
<i>Cuphea</i> , Jacq.			
<i>C. viscosissima</i> , Jacq.,		Clay, . . .	Roads and wet prairies.

Onagraceæ. Evening-Primrose Family.

<i>Oenothera</i> , L,	Evening Primrose.		
<i>O. biennis</i> , L.,			Prairies.
* <i>O. rhombipetala</i> , Nutt.,			Plains of Red River.
* <i>O. sinuata</i> , L.,			Fields and grassy places.
* <i>O. speciosa</i> , Nutt.,			Plains of Red River.
<i>O. linifolia</i> , Nutt.,		Sandy, . . .	Prairies.
* <i>O. triloba</i> , Nutt.,			Arid plains of Red River.
* <i>O. serrulata</i> , Nutt,			“ “
<i>Gaura</i> , L.			
<i>G. biennis</i> , L.,		Limestone, .	Rocky prairies.
<i>G. filipes</i> , Sp.,		“ . . .	“ “
* <i>G. sinuata</i> , Nutt.			
* <i>G. villosa</i> , Torr.			
* <i>G. coccinea</i> , Nutt.,			Plains.
* <i>G. parviflora</i> , Doug.			
<i>Stenosiphon</i> , Spach.			
<i>S. virgatus</i> , Sp.,		Magnesian limest., Barren.	
<i>Jussiaea</i> , L.			
* <i>J. repens</i> , L.,			Ponds.
* <i>J. occidentalis</i> , Nutt.,			Margin of ponds.
* <i>J. leptocarpa</i> , Nutt.,			Ponds and swamps.
<i>Ludwigia</i> , L.,	False Loosestrife.		
<i>L. alternifolia</i> , L.,			Swamps.
<i>L. polycarpa</i> , Sp. & C.,		Clay, . . .	Low prairies.
<i>L. palustris</i> , Ell.,		Limestone, .	Along streams. .
<i>Proserpinaca</i> , L.,	Mermaid weed.		
<i>P. palustris</i> , L.,			Swamps and ditches.
<i>Myriophyllum</i> , Vat.,	Water Milfoil.		
<i>M. spicatum</i> , L.,			Bayous.
* <i>M. heterophyllum</i> , Mich.,			Ponds and slow streams.
<i>M. scabratum</i> , Mich,			Mammoth Spring.

LATIN NAMES. ENGLISH NAMES. GEOLOG' L STATION. NATURAL HABITAT.

Loasaceæ.

Mentzelia, Plum.

- **M. oligosperma*, Nutt., Rocky places.
 **M. rhombifolia*, Nutt., Plains of Red River.

Cactaceæ. *Cactus Family.*

- Opuntia*, Tourn.,¹ . . Prickly pear.
O. vulgaris, L., Limestone, . . Rocks.
O. Missouriensis, Nutt., Arid plains.

Grossulaceæ. *Currant Family.*

- Ribes*, L., Currant. Gooseberry.
R. floridum, L., Limestone, . . Rocky borders of M. Spg.
 **R. aureum*, Pursh., " Banks of streams.
 **R. tenuiflorum*, Lind., " " " "

Passifloraceæ. *Passion Flower Family.*

- Passiflora*, L., Passion flower.
P. incarnata, L., Sand and clay, . . Thickets, dry, poor soil.
 **P. lutea*, L., Alluvial, Thickets, bottoms.

Cucurbitaceæ. *Gourd Family.*

- Sicyos*, L., Star Cucumber.
 **S. angulatus*, L., Sandy, Banks of rivers.

Crassulaceæ. *Orpine Family.*

- Sedum*, L., Stone-crop.
 **S. sparsiflorum*, Nutt., Plains of Red River.
S. ternatum, Mich., Limestone, . . Rocky banks.
S. pulchellum, Mich., " Humected rocks.
Penthorum, Gron., Ditch stone-crop.
P. sedoides, L., Limestone, . . Ditches and wet prairies.

Saxifragaceæ. *Saxifrage Family.*

- Saxifraga*, L., Saxifrage.
S. Virginiensis, Mich., Sandstone, &c., . . Humected rocks.

¹ The Prickly pear reddens the urine of those who eat it in some quantity. This has been taken as an effusion of blood, but it is only a harmless coloration.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Heuchera</i> , L., .	. Alum root.		
<i>H. Americana</i> , L., ¹ .	. " . . .	Limestone, &c., .	Prairies.
<i>Hydrangea</i> , Gron.			
<i>H. arborescens</i> , L., .	. . . . .	Sandstone, .	Rocky banks.

Hamamelaceæ.

<i>Hamamelis</i> , L., .	. Witch-Hazel.		
<i>H. Virginica</i> , L., ² .	. . . . .	Limestone, .	Rocky banks and woods.
<i>Liquidambar</i> , L., .	. Sweet gum.		
<i>L. styraciflua</i> , L., ³ .	. . . . .	Sandstone, .	Alluvial fertile soil.

Umbelliferæ.⁴ Parsley Family.

<i>Hydrocotyle</i> , Tour., .	. Pennywort.		
<i>H. umbellata</i> , L., .	. . . . .	Limewater, .	Mammoth Spring.
? <i>H. ranunculoides</i> , L., .	. . . . .	. . . . .	Borders of streams.
<i>Sanicula</i> , Tourn., .	. Black snakeroot.		
<i>S. Marilandica</i> , L., .	. . . . .	. . . . .	Woods and thickets.
<i>Eryngium</i> , Tour., .	. Button snakeroot.		
* <i>E. diffusum</i> , Tor., .	. . . . .	. . . . .	Canadian River.
* <i>E. Lævenworthii</i> , T & Gr., .	. . . . .	. . . . .	Plains of Red River.
<i>E. yuccæfolium</i> , Mich., .	. Button snakeroot, ⁵ .	Alluvial, .	Swamps and bottoms.
<i>E. Virginianum</i> , Lam., .	. "	Sandstone, .	Rocky open woods.
* <i>E. Baldwinii</i> , Spr., .	. . . . .	Sand,	" " sterile places.
<i>Daucus</i> , Tourn., .	. Carrot.		
? <i>D. Carota</i> , L., ⁶ .	. . . . .	. . . . .	Roadsides.
* <i>D. pusillus</i> , Mich, .	. . . . .	. . . . .	Prairies.
<i>Polytænia</i> , D C.			
? <i>P. Nuttallii</i> , D C., .	. . . . .	. . . . .	Barren.
<i>Pastinaca</i> , Tour., .	. Parsnip.		
? <i>P. sativa</i> , L., .	. . . . .	. . . . .	Fields. Introduced.

¹ This plant is generally known under the name of Alum-root. In Arkansas, it grows especially on dry rocky prairies. The whole plant is glandular, hairy, with roundish-lobed leaves from the root, like the scape, bearing a long greenish raceme of small flowers. The pulverized root is used with success in cancerous diseases.

² Resembles the true Hazel by its leaves, but easily known by greenish-yellow flowers appearing in the fall and winter. Its branches were used for divining rods. The Indians used its bark as *great medicine*. It has no real medical virtue.

³ A large and beautiful tree, with compact, fine-grained, but easily decayed wood, used for cabinet-work. The gum which exudes from the tree in summer has a pleasant odor, but no medical properties.

⁴ Plants with various properties in different parts. Roots generally eatable and wholesome, like the Carrot. Leaves and stems, as in the Water Hemlock, containing an acrid juice, often very poisonous. Seeds with an aromatic oil, which renders them tonic, stimulating, and aromatic as medicines. The name of the family indicates the disposition of their small white flowers borne on numerous pedicels arranged like the branches of an umbrella.

⁵ Plant with long linear leaves about one inch broad, ciliate with soft spines; flowers on a long peduncle, in round green heads. Root bitter, aromatic, highly esteemed in the South as diaphoretic and expectorant.

⁶ Sometimes escaped from garden.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Archemora</i> , D C., .	. Cowbane.		
<i>A. rigida</i> , D C., ¹ .	. . . . .	. . . . .	Swamps. Wet meadows.
<i>Tiedmannia</i> , D C., .	. False Water Dropwort.		
? <i>T. teretifolia</i> , D C., ²			
<i>Cymopterus</i> , Raf.			
* <i>C. glomeratus</i>, .	. . . . .	. . . . .	Plains.
<i>Cynosciadium</i> , D C.			
* <i>C. digitatum</i> , D C., .	. . . . .	. . . . .	Wet prairies and ponds.
* <i>C. pinnatum</i> , D C., .	. . . . .	. . . . .	" "
<i>Thaspium</i> , Nutt., .	. Meadow Parsnip.		
<i>T. barbinode</i> , Nutt., .	. . . . .	Limestone,	Rocky banks.
<i>Zizia</i> , D C.			
<i>Z. integerrima</i> , D C., .	. . . . .	. . . . .	Rich woods.
<i>Helosciadium</i> , Koch.			
* <i>H. leptophyllum</i> , D C., .	. . . . .	Alluvial, .	Banks.
<i>Leptocaulis</i> , Nutt.			
* <i>L. inermis</i> , Nutt., .	. . . . .	. . . . .	Prairies.
* <i>L. diffusus</i> , Nutt., .	. . . . .	. . . . .	"
* <i>L. patens</i> , Nutt., .	. . . . .	. . . . .	"
* <i>L. echinatus</i> , Nutt.			
<i>Cicuta</i> , L., .	. Water hemlock.		
? <i>C. maculata</i> , L., ³ .	. Spotted Cowbane. Beaver-poison.		Swamps.
<i>Sium</i> , L., .	. Water Parsnip.		
<i>S. angustifolium</i> , L., .	. . . . .	Limestone water,	Mammoth Spring.
<i>Chærophyllum</i> , L., .	. Chervil.		
<i>C. procumbens</i> , Lam., .	. . . . .	. . . . .	Moist, shady, rich soil.
* <i>C. Tainturieri</i> , Hook & Arn., .	. . . . .	. . . . .	Prairies.
<i>Conium</i> , L., .	. Poison Hemlock.		
? <i>C. maculatum</i> , L., ⁴ .	. . . . .	. . . . .	Roadsides. Introduced.
<i>Eulophus</i> , Nutt.			
* <i>E. Americanus</i> , Nutt., .	. . . . .	. . . . .	Prairies.
<i>Atrema</i> , D C.			
* <i>A. Americana</i> , D C., .	. . . . .	. . . . .	Prairies.
<i>Erigenia</i> , Nutt., .	. Harbinger of Spring.		
? <i>E. bulbosa</i> , Nutt., .	. . . . .	Alluvial, .	Rich shady bottoms.

¹ One of the numerous plants to which milk sickness is attributed. Poisonous to the cattle. Stem smooth. Leaves cut in three lanceolate, scarcely toothed leaflets. Common in swamps and marshy bottoms.

² I saw it in Illinois, near the Mississippi River, not far from the limits of Arkansas.

³ Plant very poisonous. Stem four to six feet high, striate, spotted green and purple. Leaves divided three times, pinnate, divisions small, lanceolate, serrate. Fruit round, laterally contracted, ribbed, with the taste of anise. Habit the marshes. Probably in Arkansas.

⁴ A large herb, with smooth spotted stems. Leaves sheathing, large, decomposed with small lanceolate leaflets. Fruit ovate, compressed, ribbed. Flowers small, with an involucre of five leaves. A violent poison, narcotic and acrid. I did not see it in Arkansas, but in Illinois. Introduced. Some other species of this family are introduced in gardens: the Parsley, Celery, Dill, Fennel, Caraway, Coriander, &c. Mostly used as condiment and for their aromatic seeds.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Araliaceæ. Ginseng Family.			
<i>Aralia</i> , L.,			
<i>A. spinosa</i> , L.,	Hercules' club,	Limestone,	River banks (rare).
<i>A. quinquefolia</i> , T. & Gr.,	Ginseng, ¹	Alluvial, &c.,	Rich woods.
Cornaceæ. Dogwood Family.			
<i>Cornus</i> , L.,Cornel.			
<i>C. florida</i> , L., ²	Dogwood,	Sand and lime, &c.	Dry hills, borders of wood.
<i>C. sericea</i> , L.,	Kinnikinnik,	Limestone, &c,	Banks of streams.
<i>C. stricta</i> , Lam.,	Stiff cornel,	"	Mammoth Spring.
<i>Nyssa</i> , L.,Tupelo.	Sour Gum.		
<i>N. multiflora</i> , Wang.,	Black gum, ³	Sandstone & chert,	Fertile soil. Hillsides, bks.
<i>N. grandidentata</i> , Mich.,	Large Tupelo, ⁴	Alluvial,	Swamps and bayous.
* <i>N. capitata</i> , Walt.,	Ogechee Lime, ⁵	"	" " " "
Caprifoliaceæ.⁶ Honeysuckle Family.			
<i>Symphoricarpus</i> , Dill., . Snowberry.			
<i>S. vulgaris</i> , Mich.,	Indian Currant,	On every formation and situation.	
<i>Lonicera</i> , L.,Honeysuckle.			
? <i>L. sempervirens</i> , Ait.,			Borders of swamps.
<i>L. albiflora</i> , T. & Gr., ⁷		Limestone,	Banks and prairies.
<i>Triosteum</i> , L.,Feverwort.	Horse Gentian.		
<i>T. perfoliatum</i> , L., ⁸	"	Limestone,	Prairies and rocky banks.
* <i>T. angustifolium</i> , L.,			Shady places.
<i>Sambucus</i> , L.,Elder.			
<i>S. Canadensis</i> , L.,		Limestone,	Rich soil, thickets.
<i>Viburnum</i> , L.,Arrow wood.			
<i>V. nudum</i> , L.,Witherod,		Alluvial,	Swamps.
<i>V. prunifolium</i> , L.,	Black haw,	Limestone,	Rocky banks, thickets.
<i>V. dentatum</i> , L.,Arrow wood,		Alluvial,	Low ground.
? <i>V. acerifolium</i> , L.,	Dock-Mackie,		Woods.

¹ Root aromatic and stimulant. Especially gathered for export to China.

² Wood close-grained, used for cabinet-work and wooden wedges. Bark astringent, tonic, febrifuge. The infusion of the flowers is used against colic. The bark of the Kinnikinnik is also febrifuge, often substituted for Cinchona.

³ Wood firm, close-grained, and not to be split, on account of the crossing of its fibres. Used for wheels or shafts, or such work as requires toughness. It burns slowly and gives much heat.

⁴ Abounds in the swamps of Southern Arkansas. A large tree. Wood soft, scarcely used.

⁵ The fruit preserved in sugar is said to have a delicious flavor.

⁶ Some species have medical properties. The flowers of the Elder are sudorific, and the bark is emetic and purgative. The root of the Feverwort or Horse-Gentian is also purgative, and in strong doses a powerful emetic.

⁷ Probably the same as I have seen growing on limestone banks above Carrollton. But the leaves only were left.

⁸ Stem hirsute, one to two feet high, with opposite oval-pointed leaves, narrowed at the base. Flowers dull brown, and scarcely remarked in the axil of the leaves. Fruit orange-yellow, resembling the fruit of the Rose.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Rubiaceæ.¹ Madder Family.			
<i>Galium</i> , L., . . .	. Bedstraw.		
* <i>G. virgatum</i> , Nutt., . . . . .	. . . . .	. . . . .	Dry prairies.
<i>G. trifidum</i> , L., . . . . .	. . . . .	Alluvial, . . .	Swamps, bottoms.
<i>G. triflorum</i> , Mich., . . . . .	. . . . .	. . . . .	Woods.
<i>G. pilosum</i> , Ait., . . . . .	. . . . .	Sandstone, . .	Dry rocky woods.
* <i>G. circæzans</i> , Mich., . . . . .	. . . . .	Alluvial, . . .	Rich soil, woodland.
<i>G. latifolium</i> , Mich., . . . . .	. . . . .	Sandy,	Rocky dry ridges.
<i>Spermacoce</i> , L., . . . . .	. Button weed.		
? <i>S. glabra</i> , L., . . . . .	. . . . .	Sand,	Banks.
<i>Diodia</i> , L.			
<i>D. teres</i> , Walt., . . . . .	. . . . .	Sandy,	Dry soil, fields, &c.
<i>Cephalanthus</i> , L., . . . . .	. Button bush.		
<i>C. occidentalis</i> , L., . . . . .	. . . . .	Alluvial, . . .	Swamps, wet meadows.
<i>Mitchella</i> , L., . . . . .	. Partridge berry.		
<i>M. repens</i> , L., . . . . .	. . . . .	Limestone, . .	Mossy, rocky banks.
<i>Oldenlandia</i> , Plum., . . . . .	. Bluets.		
? <i>O. glomerata</i> , Mich., ² . . . . .	. . . . .	Sandy,	Wet places, roadsides.
<i>O. stenophylla</i> , T. & Gr., . . . . .	. . . . .	Limestone. . .	Rocky open woods.
* <i>O. longifolia</i> , Hook., . . . . .	. . . . .	. . . . .	Shady banks.
<i>O. purpurea</i> , T. & Gr., . . . . .	. . . . .	Sandstone, . .	Rocky woods.
? <i>O. cærulea</i> , Hook., . . . . .	. . . . .	. . . . .	Prairies.
* <i>O. minima</i> , T. & Gr., . . . . .	. . . . .	. . . . .	Banks of rivers.
<i>Metreola</i> , L., . . . . .	. Mitrewort.		
? <i>M. petiolata</i> , T. & Gr., . . . . .	. . . . .	. . . . .	Damp shady soil.
<i>Spigelia</i> , L., ³ . . . . .	. Worm grass.		
<i>S. Marilandica</i> , L., . . . . .	. " . . . . .	. . . . .	Rich woods.

Valerianaceæ. Valerian Family.

<i>Fedia</i> , Moench., . . . . .	. Corn salad. ⁴		
* <i>F. longiflora</i> , Tor. & Gr., . . . . .	. . . . .	. . . . .	Plains.
* <i>F. Nuttallii</i> , T. & Gr., . . . . .	. . . . .	. . . . .	"

¹ The Madder, Cinchona, Ipecacuanha, Coffee, &c., belong to this family. The roots generally contain a red coloring matter used in dyeing; the bark has a tonic, astringent, and febrifuge principle, and the seeds of some species have the taste and stimulating property of the Coffee.

² I have not seen it in Arkansas, but in Illinois and Missouri, near the limits of Arkansas. It is probably there.

³ A well-known plant. Flower fine yellow-pink, funnel form. Root vermifuge. Ought to be used with prudence. The root should be gathered in autumn, and carefully dried before packing. It is used in infusion. If too strong, it may kill young children.

⁴ The Corn Salad (*Fedia olitoria*) is cultivated in gardens, and introduced from Europe.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Compositæ.¹			
<i>Veronnia</i> , Schreb., .	Iron weed.		
<i>V. Noveboracensis</i> , Willd., ²		On every ground	and station.
* <i>V. Baldwinii</i> , Tour., .			Arkansas River.
<i>V. fasciculata</i> , Mich., .		Limestone,	Gravel of White River.
* <i>V. Jamesii</i> , T. & Gr., .		Sand,	Arkansas River.
* <i>V. Arkanseana</i> , D C.			"
<i>Elephantopus</i> , L., .	Elephant's foot.		
<i>E. Carolinianus</i> , Willd., .		Limestone,	Alluvial bottoms.
* <i>E. tomentosus</i> , L., .			"
<i>Liatris</i> , Schr., .	Button snakeroot.		
<i>L. elegans</i> , Willd., .		Cherty Limestone,	Prairies and barrens.
<i>L. squarrosa</i> , Willd., .	Rattlesnake's master,	"	" "
<i>L. cylindracea</i> , Mich., .		Limestone,	Rocky woods and prairies.
* <i>L. punctata</i> , Hook., .			Arid plains.
<i>L. graminifolia</i> , Willd., .		Sandstone,	Pine barren, North. Arks.
<i>L. spicata</i> , Willd., .			Prairies.
<i>L. pycnostachya</i> , T. & Gr., .		Limestone,	High prairies.
<i>L. scariosa</i> , Willd., ³	Snakeroot,	"	Rocky barren.
<i>Kuhnia</i> , L.			
<i>K. Eupatorioides</i> , .		Limestone,	Barren and prairies.
<i>Eupatorium</i> , Tour., .	Throughwort.		
? <i>E. purpureum</i> , L., .		Alluvial,	Low ground.
? <i>E. coronopifolium</i> , Willd., .			Barren and prairies.
<i>E. hyssopifolium</i> , L., .		Sandstone,	Dry rocky barren.
<i>E. altissimum</i> , L., .		Limestone,	Thickets around prairies.
<i>E. perfoliatum</i> , L., .	Boneset,	Alluvial Lime.,	Swampy and rocky ground,
<i>E. serotinum</i> , Mich., .			Damp soil. [springs.
<i>E. ageratoides</i> , L., .	White Snakeroot, ⁴	" "	Borders of rich woodland.
<i>Conoclinium</i> , D C., .	Mist flower.		
<i>C. coelestinum</i> , D C., .	"	Alluvial Lime.,	Rich banks and bottoms.
<i>Sericocarpus</i> , Nees., .	White-topped Aster.		
<i>L. solidagineus</i> , Nees., .		Chert and sand,	Dry rocky woods.
<i>Aster</i> , L., .	Aster. Starwort.		
* <i>A. paludosus</i> , Ait., .			Barren and prairies.
<i>A. sericeus</i> , Vent., .		Limestone,	" "
<i>A. patens</i> , Ait , .		Sandy,	Woods and prairies.

¹ This family contains the greatest number of American plants. It has no remarkable properties. Some species are bitter, tonic, sudorific, and their virtue has been advocated without apparent reason as snake-roots, for curing the bite of snakes. No American tree belongs to this family. It has mostly useless weeds and some fine flowering plants.

² Over-credulous people have been induced to believe that the presence of this plant indicates copper in the ground below. It grows everywhere, and on every soil.

³ The root of this species and *L. squarrosa* is said to possess powerful diuretic properties, and is also used in decoction as a gargle for sore throat. (Darby.) All the *Liatris* are diuretic.

⁴ This species, as well as the Boneset, has been indicated as causing milk sickness. They are entirely harmless plants, which cannot injure the cattle. They contain a bitter, tonic, and febrifuge principle, and are much used as popular medicines. The leaves of the Boneset are united together at the base. Both common plants, with white flowers in umbellate panicles.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG'L STATION.	NATURAL HABITAT.
<i>A. lævis</i> , L.,			Dry thickets, open woods.
<i>A. turbinellus</i> , Lind.,		Limestone,	Dry prairies and barren.
<i>A. azureus</i> , Lind.,		Sandstone,	Rocky open woods.
<i>A. undulatus</i> , L.,		"	Dry woodland.
<i>A. cordifolius</i> , L.,		Alluvial Lime.,	Woods.
<i>A. sagittæfolius</i> , Willd.,		Limestone,	Open woods.
? <i>A. ericoides</i> , L.,		Sand,	Barren.
<i>A. multiflorus</i> , Ait.,		"	" and prairies.
? <i>A. dumosus</i> , L.,			Woods.
? <i>A. miser</i> , L.,		Sandy,	Old fields.
<i>A. tenuifolius</i> , L.,		Cherty Limestone,	Open hilly woods.
<i>A. puniceus</i> , L.,		Limestone,	Prairies and barren.
? <i>A. prenanthoides</i> , Muhl.,		Alluvial,	Banks and woods.
<i>A. grandiflorus</i> , L.,		Limestone,	Rocks and banks.
* <i>A. oblongifolius</i> , Nutt.,			Dry prairies.
* <i>A. divaricatus</i> , Nutt.,			Swamps & saline prairies.
<i>Erigeron</i> , L.,	Fleabane.		
<i>E. Canadense</i> , L.,		Clay, &c,	Dry open places.
* <i>E. divaricatum</i> , Mich.,		"	" "
? <i>E. Philadelphicum</i> , L.,	Fleabane, ¹		Woodland and fields.
* <i>E. tenue</i> , T. & Gr.,			Prairies & banks of rivers.
<i>E. annuum</i> , Pers.,	Daisy fleabane,		Fields and prairies.
? <i>E. strigosum</i> , Muhl.,	D.		Open places.
<i>Diptopappus</i> , Cass.,	Double-bristled Aster.		
<i>D. linearifolius</i> , Hook.,		Sandstone,	Top of rocky hills.
* <i>D. amygdalinus</i> , T. & Gr,			Moist places.
<i>Chatopappa</i> , D C.			
* <i>C. asteroides</i> , D C.,			Prairies.
<i>Boltonia</i> , L'Her.			
? <i>B. glastifolia</i> , L'Her.,			Wet woods and swamps.
<i>Bellis</i> , L.,	Daisy.		
<i>B. integrifolia</i> , Mich.,		Limestone,	Banks of streams (M.Cox).
<i>Amphiachyris</i> , D C.			
* <i>A. dracunculoides</i> , D C.,			Western Arkansas.
<i>Gutierrezia</i> , Lag.			
* <i>G. Texana</i> , T. & Gr.,			Prairies.
<i>Solidago</i> , L.,	Golden rod.		
<i>S. squarrosa</i> , Muhl.,		Limestone,	Rocky ridges.
<i>S. bicolor</i> , L.,			Open woods, dry places.
<i>S. pubens</i> , ? Curt., ²		Limestone,	Woody hills on rocks.
<i>S. cæsia</i> , L.,		Sandy,	Woods and hills.
* <i>S. angusta</i> , T. & Gr.,		Lime, ?	Hot springs.
<i>S. petiolaris</i> , Ait.,		Sandstone,	Dry open woods & prairies.
<i>S. speciosa</i> , Nutt.,		Sandy,	Prairies (rare).
<i>S. rigida</i> , L.,		"	Prairies (common).
<i>S. corymbosa</i> , Ell.,			"

¹ Has sudorific and diuretic properties.² Perhaps a variety of *Solidago bicolor*. Leaves broader and strongly ciliate.³ Differs by its very rough stem.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>S. altissima</i> var. <i>aspera</i>, . . . . .	. . . . .	. . . . .	Thickets and old fields.
<i>S. ulmifolia</i> , ? Muhl., . . . . .	. . . . .	Limestone,	Rocky ridges.
<i>S. Drummondii</i> , T. & Gr., . . . . .	. . . . .	. . . . .	Prairies.
<i>S. pilosa</i> , Walt., . . . . .	. . . . .	Sand,	Dry prairies.
<i>S. odora</i> , Ait., ¹ . . . . .	. . . . .	Sandstone,	Thickets and rocky woods.
<i>S. Boottii</i> , Hook., . . . . .	. . . . .	" . . . . .	" "
<i>S. nemoralis</i> , Ait ; . . . . .	. . . . .	. . . . .	Rocky hills.
<i>S. radula</i> , Nutt., . . . . .	. . . . .	Sandstone,	Rocky ridges.
* <i>S. scaberrima</i> ? T. & Gr., . . . . .	. . . . .	. . . . .	Dry prairies.
* <i>S. Missouriensis</i> , Nutt., . . . . .	. . . . .	. . . . .	" "
<i>S. Canadensis</i> , L., . . . . .	. . . . .	Cherty,	Rocky barren.
<i>S. gigantea</i> , Ait., . . . . .	. . . . .	. . . . .	Thickets.
<i>S. lanceolata</i> , L., . . . . .	. . . . .	. . . . .	Prairies.
<i>S. tenuifolia</i> , Pursh., . . . . .	. . . . .	Sand,	Dry prairies.
<i>Prionopsis</i> , Nutt.			
* <i>P. ciliata</i> , Nutt., . . . . .	. . . . .	Alluvial,	Banks of Salt River.
<i>Grindelia</i> , Willd.			
* <i>G. Inuloides</i> , Willd.			
<i>G. lanceolata</i> , Nutt., . . . . .	. . . . .	Magn. limestone,	Barrens.
<i>Chrysopsis</i> , Nutt.,	Golden Aster.		
? <i>C. Mariana</i> , Nutt., . . . . .	. . . . .	Sand,	Barren.
? <i>C. villosa</i> , Nutt., . . . . .	. . . . .	. . . . .	Prairies.
* <i>C. pilosa</i> , Nutt., . . . . .	. . . . .	Sandstone,	Pine woods. Open barren.
<i>Baccharis</i> , L.,	Groundsel-tree.		
* <i>B. salicina</i> , T. & Gr., . . . . .	. . . . .	. . . . .	Banks of Arkansas River.
<i>Pluchea</i> , Cass.,	Marsh Fleabane.		
<i>P. foetida</i> , D C., . . . . .	. . . . .	Alluvial,	Damp rich soil.
<i>Diaperia</i> , Nutt.			
* <i>D. prolifera</i>, . . . . .	. . . . .	. . . . .	Banks of Red River.
<i>Inula</i> , L.,	Elecampane.		[roduced ?
<i>I. Helenium</i> , L., ² . . . . .	. . . . .	. . . . .	Woods and thickets. In-
<i>Polymnia</i> , L.,	Leaf cup.		
<i>P. Canadensis</i> , L., . . . . .	. . . . .	Limestone,	Hillsides. Shady places.
<i>P. Uvedalia</i> , L., . . . . .	. . . . .	Alluvial,	Rich soil, fernes.
<i>Chrysogonum</i> , L.			
? <i>C. Virginianum</i> , L., . . . . .	. . . . .	. . . . .	Dry soil, prairies.
<i>Sylphium</i> , L.,	Rosin plant.		
<i>S. laciniatum</i> , L.,	Rosin weed,	Limestone,	Prairies.
<i>S. terebinthinaceum</i> , L.,	Prairie dock,	. . . . .	"
<i>S. trifoliatum</i> , L., . . . . .	. . . . .	. . . . .	Prairies and thickets.
<i>S. scaberrimum</i> , Ell., . . . . .	. . . . .	. . . . .	Prairies.
<i>S. integrifolium</i> , Mich., . . . . .	. . . . .	Limestone,	Barrens.
<i>Berlandiera</i> , D C.			
* <i>B. Texana</i> , D C., . . . . .	. . . . .	. . . . .	Woods.
<i>B. tomentosa</i> , T. & Gr., . . . . .	. . . . .	Sandy,	Dry Pine barrens.
? <i>B. incisa</i> , T. & Gr., . . . . .	. . . . .	. . . . .	On the Arkansas or Plate ?

¹ The leaves are infused in vinegar to give it a pleasant and aromatic taste.

² It is common enough on the rocky borders of woods, and looks indigenous.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Engelmannia</i> , T. & Gr.			
<i>E. pinnatifida</i> , T. & Gr.,			Red River plains.
<i>Parthenium</i> , L.			
<i>P. integrifolium</i> , L.			Dry prairies.
<i>Iva</i> , L.,	Marsh Elder.		
* <i>I. ciliata</i> , Willd.,			Swamps and moist places.
* <i>I. angustifolia</i> , Nutt.,			Prairies.
<i>Ambrosia</i> , Tour.,	Ragweed.		
<i>A. bidentata</i> , Mich.,		Sandy,	Roadsides and prairies.
<i>A. artemisiæfolia</i> , L.,			Prairies.
<i>A. trifida</i> , L.,		Alluvial,	Bottoms.
<i>A. polystachia</i> , D C.,		Limestone,	Barren and prairies.
<i>Xanthium</i> , Tour.,	Cockleburr.		
<i>X. strumarium</i> , L.,			Cultivated fields.
<i>Zinnia</i> , L.			
<i>Z. multiflora</i> , L., ¹		Limestone,	Prairies.
<i>Tetragonotheca</i> , Dill.			
<i>T. helianthoides</i> , L.,		Sandstone,	Open hilly woods (rare).
<i>Eclipta</i> , L.			
? <i>E. procumbens</i> , Mich.,		Alluvial,	Wet banks of rivers.
<i>Heliopsis</i> , Pers.,	Ox-eye.		
<i>H. lævis</i> , Pers. and var. <i>Scabra</i> ,			Dry soil, prairies, &c.
<i>Echinacea</i> , Münch.,	Purple cone-flower.		
<i>E. purpurea</i> , M.,			Prairies (common).
* <i>E. angustifolia</i> , D C.,			"
* <i>E. atrorubens</i> , Nutt.,			Plains.
<i>Rudbeckia</i> , L.,	Cone flower.		
* <i>R. bicolor</i> , Nutt.,			Red River, plains.
<i>R. hirta</i> , L.,		Sandy,	Dry prairies.
<i>R. fulgida</i> , Ait.,			Prairies and barrens.
? <i>R. speciosa</i> , Wend.,		Sandstone,	Rocky, open barrens.
<i>R. triloba</i> , L.,			Dry prairies.
<i>R. subtomentosa</i> , Pursh.,			Prairies.
* <i>R. grandiflora</i> , Gmel.,			Plains of Red River.
<i>R. laciniata</i> , L.,			Wet places. Thickets.
* <i>R. maxima</i> , Nutt.,			Plains, Red River.
<i>Dracopsis</i> , Cass.			
* <i>D. amplexicaulis</i> , Cass.,			Low prairies.
<i>Helianthus</i> , L.,	Sun-flower.		
* <i>H. lenticularis</i> , Dougl.,			Prairies.
* <i>H. petiolaris</i> , Nutt.,			Arid plains.
* <i>H. orgyalis</i> , D C.,			" "
* <i>H. atrorubens</i> , L.,			Dry soil.
<i>H. rigidus</i> , Desf.,			Prairies.
<i>H. lætiflorus</i> , Pers.,			Barrens and prairies.
<i>H. occidentalis</i> , Rid.,			Dry prairies.
<i>H. mollis</i> , Lam.,		Cherty limestone,	Barrens.

¹ Abounds on the prairies of Benton County, and certainly indigenous. Species cultivated in our gardens.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
*H. grosse-serratus, Mart.,	.	.	Dry plains.
H. tomentosus, Mich.,	.	Red upland,	Prairies and open places.
? H. doronicoides, Lam.,	.	Alluvial,	Bottoms.
*H. strumosus, L.,	.	.	Copses and banks of rivers.
*H. hirsutus, Raf.,	.	.	Dry prairies.
<i>Actinomeris</i> , Nutt.			
A. squarrosa, Nutt.	.	Limestone,	Banks and bottoms.
A. helianthoides, Nutt.,	.	.	Thickets and bottoms.
<i>Coreopsis</i> , L., . . . Tickseed.			
*C. involucrata, Nutt.	.	.	.
? C. tripteris, L.,	.	.	Banks of rivers.
C. verticillata, L.,	.	.	Moist places, prairies.
*C. palmata, Nutt.,	.	Limestone,	Banks and prairies.
C. lanceolata, L.,	.	.	Prairies.
*C. grandiflora, Nutt.,	.	.	Plains.
*C. tinctoria, Nutt.,	.	.	Damp prairies.
<i>Cosmidium</i> , Tor. & Gr.			
*C. filifolium, T. & Gr.,	.	.	Plains of Red River.
<i>Bidens</i> , L., . . . Bur-Marigold.			
B. cernua, L.,	.	Limestone,	Springs.
B. chrysanthemoides, Mich.,	.	Alluvial,	Swampy bottoms.
B. bipinnata, L.,	Spanish Needles,	Limestone,	Banks and dry soil.
<i>Spilanthes</i> , Sar.			
*S. Nuttallii, T. & Gr.,	.	.	Inundated places.
<i>Verbesina</i> , L., . . . Crownbeard.			
? V. Siegesbeckia, Mich.,	.	.	Banks and roadsides.
V. Virginica, L.,	.	.	Woods and dry soil.
<i>Dysodia</i> , D C.			
*D. tagetoides, T. & Gr.	.	.	.
D. chrysanthemoides, Lag.,	.	.	Banks of rivers & prairies.
<i>Gaillardia</i> , D C.			
*G. lanceolata, Mich.,	.	.	Barrens.
*G. pinnatifida, Tor.,	.	.	Plains.
*G. pulchella, Tor.,	.	.	Prairies.
<i>Palafoxia</i> , Lag.			
*P. Hookeriana, T. & Gr.	.	.	.
P. callosa, T. & Gr.,	.	Limestone,	Barrens.
<i>Hymenopappus</i> , L'Her.			
*H. corymbosus, T. & Gr.,	.	.	Prairies.
<i>Helenium</i> , L., . . . False Sunflower.			
H. autumnale, L.,	.	Alluvial,	Wet soil, prairies, &c.
*H. tenuifolium, Nutt.,	.	.	Fields and roadsides.
*H. quadridentatum, Lab.,	.	.	Banks of rivers.
? H. microcephalum, D C.,	.	.	Texas or Arkansas?
<i>Leptopoda</i> , Nutt.			
L. brachypoda, T. & Gr.,	.	.	Damp prairies.
<i>Marshallia</i> , Schreb.			
*M. cæspitosa, Nutt.,	.	.	Prairies.
M. latifolia, Pursh.,	.	Limestone,	Barrens.
<i>Maruta</i> , Cass., . . . Mayweed.			
M. cotula, D C.,	.	Sandy,	Dry fields. Introduced.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Achillea</i> , L., . . .	Yarrow.		
<i>A. millefolium</i> , L., ¹	Milfoil, . . .	Sandy, . . .	Roadsides and open places.
<i>Egletes</i> , Cass.			
* <i>E. Arkansana</i> , Nutt.			
<i>Artemisia</i> , L., . . .	Wormwood.		
? <i>A. dracunculoides</i> , Pursh.			
* <i>A. Lewisii</i> , T. & Gr.,			Plains and banks.
? <i>A. biennis</i> , Willd.,		Alluvial, . . .	Sandy banks Miss. River.
<i>Gnaphalium</i> , L., . . .	Cudweed.		
<i>G. decurrens</i> , Ives.,	Everlasting, . . .	Sandy, . . .	Woods.
<i>G. polycephalum</i> , Mich.,		Sandstone, . . .	Rocky barren.
<i>Erechtites</i> , Raf., . . .	Fireweed.		
<i>E. hieracifolia</i> , Raf., . . . . .	" . . . . .	. . . . .	Clearings on charcoal.
<i>Cacalia</i> , L.,	Indian plantain.		
? <i>C. reniformis</i> , Muhl.,		Alluvial, . . .	Rich bottoms.
<i>C. atriplicifolia</i> , L.,		Limestone, . . .	Wet prairies.
<i>C. tuberosa</i> , Nutt.,		"	"
<i>Senecio</i> , L.,	Groundsel.		
<i>S. aureus</i> , L.,	Squaw-weed, . . .	. . . . .	Swampy bottoms & banks.
<i>Centaurea</i> , L.,	Star thistle.		
* <i>C. Americana</i> , Nutt., . . . . .		. . . . .	Western Arkansas.
<i>Cirsium</i> , Tour.,	Plumed thistle.		
<i>C. altissimum</i> , Spreng.,		Alluvial, . . .	Rich soil. Thickets.
<i>C. discolor</i> , Spreng.,		Limestone, . . .	Fields and thickets.
<i>C. Virginianum</i> , Mich.,		Sandstone, . . .	Woods and barrens.
? <i>C. horridulum</i> , Mich., . . . . .		. . . . .	Hills. Poor soil.
<i>Lappa</i> , Tour., ²	Burdock.		
<i>L. major</i> , Gært., . . . . .		. . . . .	Around dwellings.
<i>Apogon</i> , Ell.			
* <i>A. humilis</i> , Ell.			
<i>Krigia</i> , Schreb.,	Dwarf Dandelion.		
* <i>K. Occidentalis</i> , Nutt.			
? <i>K. Virginica</i> ,		Sandy, . . .	Moist ground.
<i>Cynthia</i> , Don.			
? <i>C. Virginica</i> , Don.,		"	"
* <i>C. Dandelion</i> , D C., . . . . .		. . . . .	Low ground and fields.
<i>Hieracium</i> , Tour.,	Hawk-weed.		
<i>H. scabrum</i> , Mich.,		Sandstone, . . .	Rocky woody places.
<i>H. longipilum</i> , Tor.,		"	Dry prairies.
* <i>H. Gronovii</i> , L.,		"	Sterile prairies.
<i>Nabalus</i> , Cass.,	Rattlesnake-Root.		
<i>N. albus</i> , Hook.,	White Lettuce, . . .	Limestone, . . .	Rocky thickets.
<i>N. altissimum</i> , Hook.,		"	Rocky open woods and
? <i>N. Fraseri</i> , D C.,	Lion's foot,	Sandy, . . .	Dry soil. [thickets.

¹ Has some tonic and aromatic properties. Leaves employed for cicatrizing wounds, either by decoction as tea for internal lesions, or by application of masticated leaves on the wounds. It is said to be an active remedy in cases of Intermittent fevers, and also against the Piles. It was once much employed and its value praised for a number of diseases.

² Everybody knows this plant, which sometimes becomes a pest around dwellings. It is bitter. The leaves, according to Dr. Darlington, are used as external application in fevers, headache, &c.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>N. virgatus</i> , D C., . . . . .	.	Sandy,	Barren and rocky prairies.
<i>N. asper</i> , T. & Gr., . . . . .	.	.	Dry prairies.
<i>Taraxacum</i> , Hall, ¹	Dandelion.	.	.
<i>T. Dens-leonis</i> , Desf., . . . . .	.	.	Fields. Introduced.
<i>Pyrrhopappus</i> , D C.,	False Dandelion.	.	.
* <i>P. Carolinianus</i> , D. C., . . . . .	.	.	Fields.
* <i>P. grandiflorus</i> , Nutt., . . . . .	.	.	Shaded ravines.
<i>Lactuca</i> , Tour.,	Lettuce.	.	.
<i>L. elongata</i> , Muhl., . . . . .	.	.	Rich fields, fences.
<i>Mulgedium</i> , Cass.,	Blue Lettuce.	.	.
<i>M. Floridanum</i> , D C., . . . . .	.	.	Borders of fields & thickets.

Lobeliaceæ. *Lobelia Family.*

<i>Lobelia</i> , L,	Lobelia.	.	.
<i>L. cardinalis</i> , L., ²	Cardinal flower,	Limestone,	Low ground, rich bottoms.
<i>L. syphilitica</i> , L., ³	Great Lobelia,	"	Banks. Hot springs.
? <i>L. leptostachys</i> , D C., ⁴ . . . . .	.	Sand,	Banks. Mississippi River.
? <i>L. amœna</i> , Mich., . . . . .	.	.	Swamps.
<i>L. inflata</i> , L., ⁵	Indian tobacco,	.	Dry open soil.
<i>L. spicata</i> , Lam., . . . . .	.	.	" "

Campanulaceæ.

<i>Campanula</i> , Tour.,	Bell flower.	.	.
<i>C. Americana</i> , L., . . . . .	.	Limestone,	Shaded banks and rich [woods.
<i>Specularia</i> , Heist.	.	.	.
<i>S. perfoliata</i> , D C., . . . . .	.	Sand,	Dry open fields.

Ericaceæ.⁵ *Heath Family.*

<i>Gaylussacia</i> , H. B. K.,	Huckleberry.	.	.
<i>G. frondosa</i> , T. & Gr.,	Dangleberry, . . . . .	.	Low ground.
? <i>G. dumosa</i> , T. & Gr.,	Dwarf Huckleberry,	Sandstone,	Barrens.
<i>G. resinosa</i> , T. & Gr.,	Black Huckleberry,	"	Rocky hills, open woods.
<i>Vaccinium</i> , L.,	Cranberry, Blueberry.	.	.
<i>V. stamineum</i> , L.,	Deerberry,	Sandstone,	Hilly open woods.

¹ Its milky sap is bitter. The stems, like the root, are used for purifying the blood in the spring. The stalk of the flower is eaten raw for that purpose. The boiled leaves make excellent and wholesome greens.

² A beautiful flower known by everybody, and often cultivated. The Indians use the root as vermifuge.

³ Taken in small dose, its root acts as sudorific. A stronger dose acts as purgative, and still a stronger as emetic. It has a beautiful raceme of blue flowers.

⁴ Was not found in Arkansas, but near its northern limits. Probably descends further south.

⁵ A virulent poison, and dangerous quack medicine.

⁶ Shrubby plants. Bark and leaves astringent and tonic. Fruit sometimes acid and eatable with still more astringency, and thus febrifuge and very wholesome. The leaves of some species are used as a substitute for tea. The leaves of other species are used as a remedy against the gravel. Some species have poisonous leaves.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>V. arboreum</i> , Mich.,	. Facklberry, . . .	Sandstone, . . .	. Rocky woods and banks.
<i>V. corymbosum</i> , L.,	. Swamp blueberry, . .	Alluvial, . . .	. Margin of swamps.
<i>Epigæa</i> , L., . . .	. Ground Laurel.		
<i>E. repens</i> , L., . . .	. . . . .	Sandstone, . . .	. Shady, mossy banks.
<i>Gaultheria</i> , Kal., . .	. Aromatic Wintergreen.		
<i>G. procumbens</i> , L., ¹	. "	Sandstone, . . .	. Cool, damp woods & hills.
<i>Leucothoë</i> , Don.			
<i>L. axillaris</i> , Don., . .	. . . . .	Sandstone, . . .	. Banks of streams.
? <i>L. Catesbæi</i> , Gray,	. . . . .	" . . . .	. Top of hills, barren.
<i>Andromeda</i> , L.			
? <i>A. Ligustrina</i> , Muhl.,	. . . . .	Sandy, . . . .	. Borders of swamps.
<i>Oxydendron</i> , D C., . .	. Sorrel-tree.		
<i>O. arboreum</i> , L., . . .	. . . . .	Sandstone, . . .	. Rocky woods.
<i>Clethra</i> , L., . . . .	. Sweet Pepperbush.		
? <i>C. alnifolia</i> , L., . . .	. . . . .	. . . . .	. Swamps.
<i>Kalmia</i> , L., . . . .	. American laurel.		
<i>K. latifolia</i> , L., ² . . .	. Calico-bush, . . .	Sandstone, . . .	. Rocky banks (rare).
<i>Rhododendron</i> , L., . .	. Rose-bay.		
<i>R. maximum</i> , L., ³ . . .	. Great laurel, . . .	"	"
<i>Azalea</i> , L., . . . .	. False Honeysuckle.		
<i>A. viscosa</i> , L., . . . .	. . . . .	. . . . .	. Swamps.
<i>A. nudiflora</i> , L., . . .	. . . . .	. . . . .	"
<i>Chimaphila</i> , Pursh., . .	. Pipsissewa.		
? <i>C. umbellata</i> , Nutt, ⁴	. "	Sandy, . . . .	. Woods.
<i>C. maculata</i> , Pursh., . .	. Spotted Wintergreen,	" . . . .	. Rocky woods.
<i>Monotropa</i> , L., . . . .	. Indian pipe.		
? <i>M. uniflora</i> , L., . . .	. " . . . .	. . . . .	. Rich woods.
? <i>M. hypopitys</i> , L., . .	. Pine sap, . . . .	. . . . .	. Oak and pine woods.

Aquifoliaceæ.⁵ *Holly Family.*

<i>Ilex</i> , L., . . . .	. Holly.		
<i>I. opaca</i> , Ait., . . . .	. " . . . .	Sandstone, . . .	. Hills and alluvial bottoms.
<i>I. Cassine</i> , L., ⁶ . . . .	. Yaupon,	Limestone tufa,	Hot Springs.
<i>I. decidua</i> , Walt., . . . .	. . . . .	" . . . .	. Banks and borders of prai-
<i>I. verticillata</i> , Gr., . .	. Black alder, . . . .	" . . . .	. Rocky banks. [ries.

¹ The leaves have a pleasant aromatic taste, and are used for tea. Somewhat narcotic. Berries eatable.

² The decoction of the leaves of this species is poisonous. It is an evergreen smooth shrub, with elliptical pointed, shining leaves, and with wheel-shaped showy flowers in corymbs or umbels. Leaves and flower smaller than in the next species.

³ I have not seen the flowers, and it may be another species of the same genus. The infusion of the leaves is given in cases of chronic rheumatism, though the leaves are said by some to be poisonous.

⁴ The *herbe a pissier* of the Canadians. This plant and the following were both used as great medicines by the Indians, especially in cases of Scrofula and Rheumatism. They are diuretic plants, used with success in case of gravel in the bladder. Small evergreen. The last with dark-green, lanceolate, oval-pointed, dentate leaves, marked with white along the veins.

⁵ The berries of plants of this family are acrid, purgative, and emetic.

⁶ Leaves used for tea, the celebrated black drink of the North Carolinian Indians. (Gray.)

LATIN NAMES. ENGLISH NAMES. GEOLOG' L STATION. NATURAL HABITAT.

Styracaceæ. *Storax Family.*

<i>Styrax</i> , Tour., . . .	Storax.		
* <i>S. grandifolia</i> , Ait.,			Rich woods.
? <i>S. Americana</i> , Lam.,			Margin of swamps.
<i>Symplocos</i> , Jacq., . . .	Sweet leaf.		
<i>S. tinctoria</i> , L'Her., ¹	"	Alluvial, . . .	Swamps.

Ebenaceæ. *Ebony Family.*

<i>Diospyros</i> , L., ²	Persimmon.		
<i>D. Virginiana</i> , L.,	"	Limestone, &c.,	Barren and rich soil.
<i>Bumelia</i> , Sw.			
* <i>B. lycioides</i> , Ga.,		Alluvial, . . .	Moist bottoms.
<i>B. lanuginosa</i> , Pers.,		Limestone, . .	Rocky bar'ns along creeks.
* <i>B. oblongifolia</i> , Nutt.,		Alluvial, . . .	Woods.

Plantaginaceæ. *Plantain Family.*

<i>Plantago</i> , L.,	Plantain. Ribgrass.		
<i>P. major</i> , L.,			Moist fertile soil.
* <i>P. heterophylla</i> , Nutt.,			Arkansas River.
<i>P. aristata</i> , Mich.,		Sandy.	Prairies, dry places.
<i>P. virginica</i> , L.,		Sand,	Prairies, open places.
* <i>P. pusilla</i> , Nutt.,		Sandstone, . .	Dry hills.
* <i>P. squarrosa</i> , Nutt.,		Sandy,	Prairies near Fort Smith.

Primulaceæ. *Primrose Family.*

<i>Androsace</i> , Tour.			
* <i>A. Occidentalis</i> , Pursh.,			Banks of rivers.
<i>Dodecatheon</i> , L.,	American Cowslip.		
<i>D. Meadia</i> , L.,		Limestone, &c.,	Rich woods and wet prai-
<i>Lysimachia</i> , L.,	Loosestrife.		[ries.
<i>L. ciliata</i> , L.,			Wet prairies, low ground.
<i>L. lanceolata</i> , Walt.,			Low ground (M. Cox).
<i>Anagallis</i> , L.,	Pimpernel.		
* <i>A. arvensis</i> , L.,			Cultivated fields. ¹
<i>Centunculus</i> , L.,	Chaffweed.		
* <i>C. minimus</i> , L.,			Low ground.
<i>Samolus</i> , L.,	Brookweed.		
<i>S. Valerandi</i> , L.,		Sandy,	Springs, banks, &c.

Lentibulaceæ. *Bladderwort Family.*

<i>Utricularia</i> , L.,	Bladderwort.		
* <i>U. vulgaris</i> , L.,			Ponds and bayous.

¹ Leaves sweet, greedily eaten by cattle. Abundant in the bottoms of South Arkansas.
² Very common in Arkansas, where it grows of a good size in a good soil. Wood greenish, hard, compact, but liable to split. Bark bitter and tonic, used as a remedy in cases of intermittent fevers.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Bignoniaceæ.			
<i>Bignonia</i> , Tour.			
<i>B. capreolata</i> , L.,			Climbing. Rich bottoms.
<i>Tecoma</i> , Juss.,	Trumpet flower.		
<i>T. radicans</i> , L.,	"		Rich soil. Climbing.
<i>Catalpa</i> , Scop.,	Indian bean.		
<i>C. Bignonioides</i> , Walt., ¹ .	"	Limestone,	Creeks and rocky banks.
Orobanchaceæ. Broom-rape Family.			
<i>Aphyllon</i> , Mich.,			
* <i>A. uniflorum</i> , T. & Gr.,	Broom-rape.		Woods.
Scrophulariaceæ. Figwort Family.			
<i>Verbascum</i> , L.,			
<i>V. thapsus</i> , L., ²	Mullen.	Sandy,	Dry open fields.
<i>V. blattaria</i> , L.,	"	"	Prairies.
<i>Linaria</i> , Tour.,			
* <i>L. Canadensis</i> , Sp.	Toad flax.	Sandy,	Prairies.
<i>Scrophularia</i> , Tour.,			
<i>S. nodosa</i> , L.,	Figwort.	Limestone,	Banks & borders of fields.
<i>Collinsonia</i> , Nutt.			
* <i>C. violacea</i> , Nutt.,			Woods.
<i>Chelone</i> , Tour.,			
<i>C. glabra</i> , L.,	Turtlehead.		
<i>C. glabra</i> , L.,	"		Wet prairies.
<i>Penstemon</i> , Mit.,			
<i>P. pubescens</i> , Sol.,	Beard tongue.	Limestone,	Banks and rocky prairies.
* <i>P. digitalis</i> , Nutt.,			Woods. Dry soil.
* <i>P. tubæflorum</i> , Nutt.,			Prairies.
* <i>P. Cobæa</i> , Nutt.,		Limestone,	Red River.
<i>Conohea</i> , Aub.			
* <i>C. multifida</i> , Benth.,		Sand,	River banks.
<i>Mimulus</i> , L.,			
<i>M. alatus</i> , Ait.,	Monkey flower.	Limestone,	Border of shallow creeks.
<i>Herpestis</i> , Gaert.			
<i>H. rotundifolia</i> , Pursh.,			Muddy ditches.
* <i>H. Brownei</i> , Steud.,			Banks of Mississippi.
<i>H. nigrescens</i> , Benth.,		Limestone, &c.,	Rocky, sandy places. Hot
<i>Gratiola</i> , L.,	Hedge-Hyssop.		[Springs.]
* <i>G. Virginiana</i> , L.,			Wet places, ditches.
* <i>G. pilosa</i> , Mich.,			Low ground.
* <i>G. acuminata</i> , Ell.,			" "

¹ This well-known tree bears large heart-shaped leaves, bunches of large white flowers, and seeds in long pendant beans. Though it is not common in Arkansas, it is found abundant enough along the limestone creeks on the western limits of Benton County, where it appears indigenous. Various properties have been ascribed to its bark. But they are not ascertained. The wood is light and durable, resembling the wood of the sycamore. It is not much used.

² Flowers used as tea; emollient in pulmonary diseases.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Ilysanthes</i> , Raf.			
<i>I. gratioides</i> , Benth.,	False Pimpernel.	Limestone,	Gravel of rivers.
<i>Veronica</i> , L.,	Speedwell.		
<i>V. Virginica</i> , L.,		"	Prairies and barren.
<i>V. Americana</i> , Schw.,		"	Springs. Mammoth Spring.
* <i>V. peregrina</i> , L.,			Cultivated fields.
<i>Buchnera</i> , L.,	Blue Hearts.		
<i>B. Americana</i> , L.,			Prairies. Wet places.
<i>Seymeria</i> , Pursh.			
<i>S. macrophylla</i> , Nutt.,			Gravel. White River.
<i>Gerardia</i> , L.			
<i>G. purpurea</i> , L.,		Sandstone,	Rocky woods and prairies.
* <i>G. longifolia</i> , Nutt.,		Sandy,	Banks of Arkansas River.
<i>G. aspera</i> , Dougl.,		Limestone,	Gravel of Mammoth Sp'g.
* <i>G. heterophylla</i> , Nutt.,			Prairies.
<i>G. flava</i> , L.,		Sandst. and chert,	Hilly, rocky open woods.
<i>G. quercifolia</i> , Pursh.,		Sandstone,	Rocky woods.
<i>G. integrifolia</i> , Gray,		"	" "
* <i>G. pedicularia</i> , L.,			Dry copses.
* <i>G. auriculata</i> , Mich.,			Low ground.
<i>Castilleja</i> , L.,	Painted cup.		
<i>C. coccinea</i> , Sp.,			Prairies.
* <i>C. purpurea</i> , Nutt.,			Rocks. Red River.
<i>Pedicularis</i> , Tour.,	Lousewort.		
<i>P. Canadensis</i> , L.,			Prairies. Wet places.
<i>Melampyrum</i> , Tour.,	Cow-Wheat.		
* <i>M. Americanum</i> , Mich.,			Open woods.
<i>Gelsemium</i> , Juss.,	Yellow Jessamine.		
<i>G. sempervirens</i> , Ait.,		Alluvial,	Rich bottoms. Climbing.

Acanthaceæ.

<i>Dianthera</i> , Gron.,	Water Willow.		
<i>D. Americana</i> , L.,			Border of streams.
<i>Dipteracanthus</i> , Nees.			
<i>D. strepens</i> , Nees.,			Dry sandy soil.
<i>D. ciliolus</i> , Nees.,		Sandy,	Prairies.
* <i>D. humilis</i> , Nutt.,			Rocks and prairies.
<i>Dicliptera</i> , Wahl.			
* <i>D. resupinata</i> , Wahl.			

Verbenaceæ. *Vervain Family.*

<i>Verbena</i> , L.,	Vervain.		
<i>V. hastata</i> , L.,			Waste fertile ground.
<i>V. urticæifolia</i> , L.,			Old fields. Roadsides.
<i>V. stricta</i> , Vent.,		Sandstone,	Barrens and rocky creeks.
<i>V. bracteosa</i> , Mich.,		Limestone,	Rocky ridges.
<i>V. Aubletia</i> , L.,		"	Rocky places and prairies.
* <i>V. Caroliniana</i> , Mich.,			Dry soil.
* <i>V. rugosa</i> , Willd.,			" "
* <i>V. bipinnatifida</i> , Nutt.,			Open hills. Red River.
<i>Lippia</i> , L.			
* <i>L. lanceolata</i> , Mich.,			River banks.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Callicarpa</i> , L.			
<i>C. Americana</i> , L., ¹	French Mulberry,	Sandstone & Tufa,	Rocky places.
<i>Phryma</i> , L., . . .	Lopseed.		
* <i>P. leptostachya</i> , L.,		Limestone,	Copses and banks.
Labiatae.² Mint Family.			
<i>Teucrium</i> , L., . . .	Germander.		
* <i>T. Canadense</i> , L.,	Woodsage,		Low grounds.
<i>Trichostema</i> , L., . . .	Blue Curls.		
<i>T. dichotomum</i> , L., . . .	Bastard Pennyroyal,	Chert,	Sandy, open woods.
* <i>T. lineare</i> , Nutt.,		Sandstone,	Rocky, open ground.
<i>Isanthus</i> , Mich., . . .	False Pennyroyal.		
<i>I. cæruleus</i> , Mich.,		Limestone,	Banks of Miss. River, in [Missouri.
<i>Mentha</i> , L.,	Mint.		
<i>M. viridis</i> , L., ³	Spear-mint,	Limestone,	Springs. Mammoth Spg.
* <i>M. Canadensis</i> , L.,	Wild mint,		Wet banks. Brooks.
<i>Lycopus</i> , L.,	Water Horehound.		
* <i>L. Virginicus</i> , L.,			Shady moist places.
* <i>L. Europæus</i> , L.,			" "
<i>L. sinuatus</i> , L.,			Wet ground.
<i>Cunila</i> , L.,	Dittany.		
<i>C. Mariana</i> , L.,	"	Sandstone,	Rocky hills.
<i>Pycnanthemum</i> , Mich., . . .	Basil.		
<i>P. incanum</i> , Mich.,		Cherty limestone,	Rocky woods.
<i>P. clinopodioides</i> , T. & Gr.,			Dry prairies and woods.
<i>P. pilosum</i> , Nutt.,			Hillsides, prairies.
<i>P. muticum</i> , Pers.,		Sandstone,	Dry open woods.
<i>P. lanceolatum</i> , Pursh.,		"	Rocky woods and prairies.
<i>P. linifolium</i> , Pursh.,		Limestone,	High prairies. Mammoth [Spring.
<i>Origanum</i> , L.,	Wild Marjoram.		
* <i>O. vulgare</i> , L.,			Introduced.
<i>Calamintha</i> , Moench., . . .	Basil.		
* <i>C. nepeta</i> , Link.,		Sandstone,	Dry hills. (Introduced.)
<i>C. Nuttallii</i> , Bent.,		Limestone,	Rocks.
* <i>C. clinopodium</i> , Benth.,			Thickets. (Introduced.)
<i>Melissa</i> , L.,	Balm.		
<i>M. officinalis</i> , L., ⁴			Cultivated. From Europe.
<i>Hedeoma</i> , Pers.,	Pennyroyal.		
<i>H. pulegioides</i> , Pers.,		Sandy,	Dry places.

¹ Fruit beautiful and eatable.

² The most natural family of plants either by its form or by its properties. All the plants of the Mint family have tonic, cordial, invigorating properties. They contain apparently two principles, the one bitter, stomachic, and febrifuge, the other aromatic, stimulating, and excitant. Plants of this family are used for condiments, like the sage, or for medical preparations. They are easily known by the aromatic odor that is exhaled by bruising their leaves.

³ Said to have been introduced to the Mammoth Spring by Indians. This species give the oil of Peppermint of the shops, generally known as a valuable family medicine, and used against Colic, Diarrhœa, Dysentery, Cholera, Nausea, &c. &c.

⁴ Has the same properties as the Mint.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
* <i>H. hispida</i> , Pursh.			
* <i>H. Arkansæana</i> , Nutt.,			Sources of Ramiesha Riv.
<i>Collinsonia</i> , L.,	Horse-balm.		
<i>C. Canadensis</i> , L.,			Rich moist woods.
<i>Salvia</i> , L., ¹	Sage.		
<i>S. lyrata</i> , L.,		Limestone?	Hot springs, on tufa.
<i>S. azurea</i> , Lam.,		"	Rocks and rocky places.
* <i>S. longifolia</i> , Nutt.,			Prairies.
* <i>S. Claytoni</i> , Ell.,			Dry meadows and prairies.
<i>Monarda</i> , L.,	Horse Mint.		
<i>M. fistulosa</i> , L.,	Wild Bergamot,	Limestone,	Prairies and barren.
<i>M. Bradburiana</i> , Beck.,		Sandstone,	Rocky woods and prairies.
<i>M. punctata</i> , L.,			Prairies. Fort Smith.
* <i>M. Russeliana</i> , Nutt.,			" "
* <i>M. aristata</i> , Nutt.,			Red River plains.
<i>Blephilia</i> , Raf.			
<i>B. ciliata</i> , Raf.,			Rich soil. Fences, &c.
<i>Lophanthus</i> , Benth.,	Giant Hyssop.		
* <i>L. nepetoides</i> , Benth.,			Borders of wood.
* <i>L. scrophulariæfolius</i> , Benth.,			" "
<i>Nepeta</i> , L.,	Cat Mint.		
<i>N. Cataria</i> , L.,	Catnip,	Limestone,	Rocky places around farms.
<i>N. glechoma</i> , Benth., ²	Ground Ivy, Gil.,	Charcoal,	New clearings, fences, &c.
<i>Dracocephalum</i> , L.,	Dragon-head.		
* <i>D. intermedium</i> , Nutt.,			Prairies.
<i>Synandra</i> , Nutt.			
? <i>S. grandiflora</i> , Nutt.,			Shady banks. Rich soil.
<i>Physostegia</i> , Benth.,	False Dragon-head.		
<i>P. Virginiana</i> , Benth.,			Marshy prairies.
<i>Brunella</i> , Tour.			
<i>B. vulgaris</i> , L.,		Limestone,	Rocky places and prairies.
<i>Scutellaria</i> , L.,	Skull-cap.		
<i>S. versicolor</i> , Nutt.,			River banks and woods.
<i>S. canescens</i> , Nutt.,			Borders of prairies.
* <i>S. parvula</i> , Mich.,		Limestone,	Dry banks and rocks.
<i>S. nervosa</i> , Pursh.,		"	Rocky woods.
<i>S. lateriflora</i> , L.,			Mammoth Spring.
<i>S. resinosa</i> , Tor.,		Limestone,	Barren.
<i>Marrubium</i> , L., ³	Horehound.		
* <i>M. vulgare</i> , L.,		Around dwellings,	Wet places. (Introduced.)
<i>Stachys</i> , L.			
* <i>S. aspera</i> , Mich.,			Wet ground.

¹ The garden sage, a native of South France, is tonic, stomachic, and anti-hysterie.

² A common species, introduced from Europe. It appears everywhere on the burnt ground of the clearings. It has been commended as a valuable remedy in infusion of leaves and flowers against asthma; even in cases of consumption. Some assert that the plant eaten by horses causes them to become broken winded. Homœopathy would explain easily (*similia similibus curantur*) these contradictory properties.

³ Like the Ground-Ivy, used in decoction in cases of consumption or of prolonged coughs and difficult expectoration.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
* <i>S. hyssopifolia</i> , Mich.,	.	Sandy,	Wet places.
<i>Lamium</i> , L.,	Dead Nettle.		[roduced.]
* <i>L. amplexicaule</i> , L.,	.	.	A weed in gardens. (In-

Borraginacæ.¹ *Borage Family.*

<i>Onosmodium</i> , Mich.,	False Gromwell.		
<i>O. Virginianum</i> , D C.,	.	Sandstone,	Dry prairies, rocky woods.
<i>Lithospermum</i> , Tour.,	Gromwell.		
* <i>L. arvense</i> , L.,	.	Sand,	Banks and roadsides.
* <i>L. tenellum</i> , Nutt.,	.	.	Plains of Red River.
? <i>L. angustifolium</i> , Mich.,	.	.	River banks.
<i>L. hirtum</i> , Leh.,	.	Limestone,	Banks and prairies.
* <i>L. canescens</i> , Leh.,	.	.	Open woods.
* <i>L. longiflorum</i> , Spreng.,	.	.	Prairies and plains.
<i>Mertensia</i> , Roth.,	Lungwort.		
<i>M. Virginica</i> , D C ,	"	Alluvial,	Rich soil. Banks.
<i>Myosotis</i> , L.,	Forget-me-not.		
* <i>M. verna</i> , Nutt.,	.	Sandy,	Dry hills.
<i>Echinopspermum</i> , Sw.,	Stick-seed.		
<i>E. lappula</i> , Leh.,	.	Alluvial,	Woods, waste places, &c.
<i>Cynoglossum</i> , Tour.,	Hounds-tongue.		
* <i>C. officinale</i> , L.,	.	.	Waste ground. Pastures.
<i>C. Virginicum</i> , L., ²	Wild Comfrey,	Sandstone,	Woods and hills.
<i>Heliotropium</i> , Tour.			
* <i>H. Curassavicum</i> , L.,	.	Sand,	Banks of Mississippi R.
<i>H. Indicum</i> , L.,	.	.	" " "
<i>Euploca</i> , Nutt.			
* <i>E. convolvulacea</i> , Nutt ,	.	Sand,	Banks of Arkansas River.

Hydrophyllacæ.

<i>Hydrophyllum</i> , L.,	Water-leaf.		
* <i>H. Virginicum</i> , L.,	.	Alluvial,	Rich woods.
<i>Nemophila</i> , Nutt.			
* <i>N. microcalyx</i> , F. & M.,	.	.	Rich moist woods.
* <i>N. phaceloides</i> , Nutt.,	.	.	Cedar prairie near Fort
<i>Ellisia</i> , L.			[Smith.]
* <i>E. ranunculacea</i> , Nutt.			
<i>Phacelia</i> , Juss.			
<i>P. hirsuta</i> , Nutt.,	.	.	Cadron River.
* <i>P. glabra</i> , Nutt.,	.	.	"
<i>P. Purshii</i> , Buck.,	.	.	Banks ? (M. Cox.)
<i>Hydrolea</i> , L.			
* <i>H. ovata</i> , Nutt.			

¹ Plants of this family contain a sweet and emollient mucilage, more abundant in the roots, employed as sedative. Some species have in the root a red coloring matter used in dyeing.

² Its root is used for dyeing red. Common in Arkansas.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Polemoniaceæ.			
<i>Polemonium</i> , Tour.,	. Greek Valerian.		
<i>P. reptans</i> , L.,	Limestone,	. Shady river banks, &c.
<i>Phlox</i> , L.			
<i>P. paniculata</i> , L.,	Rich woods.
* <i>P. maculata</i> , L.,	" and banks.
<i>P. pilosa</i> , L.,	Sandstone,	. Prairies and rocky hills.
* <i>P. reptans</i> , Mich.,	Damp woods.
* <i>P. glomerata</i> , Nutt.			
<i>Gilia</i> , Ruiz.			
* <i>G. coronopifolia</i> , Pers,	Sand,	. . Dry prairies.
Convolvulaceæ.¹			
<i>Ipomœa</i> , L.,		Morning-glory.
* <i>I. purpurea</i> , Lam.,	Nuttall's Catalogue.
* <i>I. Nil</i> , L.,	" "
* <i>I. lacunosa</i> , L.,	Woods and fields.
* <i>I. pandurata</i> , Mey.,	Sandy,	. Fields and dry banks.
* <i>I. tamnifolia</i> , Willd.,	"	. Banks of Mississippi Riv.
<i>Convolvulus</i> , L.,		Bindweed.
* <i>C. arvensis</i> , L.,	Sandy,	. Fields.
* <i>C. hastatus</i> , Nutt.,	Red River.
<i>Evolvulus</i> , Mich.			
* <i>E. nummularius</i> , Mich.,	Mississippi, banks.
* <i>E. pilosus</i> , Nutt.,	Red River.
<i>Dichondra</i> , Forst.			
* <i>D. repens</i> , F.,	Moist ground.
<i>Cuscuta</i> , Tourn.,		Dodder.
* <i>C. Gronovii</i> , Willd.,	On Herbes,	. Shady marshy places.
<i>C. glomerata</i> , Choisy.,	On Compositæ,	. Wet prairies.
Solanaceæ.² Nightshade Family.			
<i>Solanum</i> , L.,		Nightshade.
<i>S. nigrum</i> , L.,	Waste places.
<i>S. Caroliniense</i> , L.,	Sand,	. Road and dry barren.
<i>Physalis</i> , L.,		Ground Cherry.
<i>P. Philadelphica</i> , Lam.,	Sandy,	. Barren soil.

¹ The roots of all the Bind-weeds (*Convolvulus*) have a milky, bitter, and purgative sap. When the principle is in small quantity and mixed with fecula, it becomes rather aromatic, and the root becomes a wholesome food for man, as in the Sweet Potato (*Convolvulus-batatas*).

² The plants of this family, at least their stems and leaves, are sometimes poisonous. The roots and the fruits of some species are wholesome food, like the Potato and the Tomato. American species appear far less poisonous than European ones. Thus the fruits of our *Physalis* (Ground cherries), are eaten by children, and Tobacco is chewed by everybody without inconvenience. The Egg plant (*Solanum esculentum*), the Red pepper (*Capsicum annuum*), the Tomato (*Lycoperson esculentum*), and others belong to this family.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
* <i>P. pubescens</i> , L., . . . . .	. . . . .	. . . . .	Low ground.
<i>P. viscosa</i> , L., . . . . .	. . . . .	. . . . .	Waste places.
* <i>P. pumila</i> , Nutt., . . . . .	. . . . .	. . . . .	Arkansas. Nutt. Cat.
* <i>P. longifolia</i> , Nutt., . . . . .	. . . . .	. . . . .	Sandy banks of Arkan. R.
* <i>P. mollis</i> , Nutt., . . . . .	. . . . .	. . . . .	" " "
<i>Datura</i> , L.,	Thorn apple.	. . . . .
<i>D. stramonium</i> , L., ¹	"	Alluvial,	Waste grounds.

Gentianaceæ.² *Gentian Family.*

<i>Sabbatia</i> , Adans.,	Centaury.		
<i>S. angularis</i> , Pursh., ³ . . . . .	. . . . .	. . . . .	Prairies and low thickets.
* <i>S. campestris</i> , Nutt., . . . . .	. . . . .	. . . . .	Prairies of Red River.
<i>Gentiana</i> , L., ⁴	Gentian.		
<i>G. ochroleuca</i> , Frœl., ⁵ . . . . .	. . . . .	. . . . .	Prairies around Fayettev'e.
<i>G. Andrewsii</i> , Gris., . . . . .	. . . . .	. . . . .	Rich wet prairies.
<i>G. saponaria</i> , L., . . . . .	. . . . .	. . . . .	Woods and prairies.
<i>G. puberula</i> , Mich., . . . . .	. . . . .	Cherty Limestone,	Dry rocky prairies.
<i>Limnanthemum</i> , Gmel.,	Floating Heart.		[ing.
<i>L. lacunosum</i> , Gris., . . . . .	. . . . .	. . . . .	Ponds and bayous. Float-

Asclepiadaceæ.⁶ *Milkweed Family.*

<i>Asclepias</i> , Tour.,	Milkweed.		
? <i>A. cornuti</i> , D C., . . . . .	. . . . .	. . . . .	Rich soil.
<i>A. variegata</i> , L., . . . . .	. . . . .	. . . . .	Prairies? (M. Cox.)
* <i>A. Nuttalliana</i> , Tor., . . . . .	. . . . .	. . . . .	Prairies.
* <i>A. parviflora</i> , Pursh., . . . . .	. . . . .	Sand,	Barren.
<i>A. pauperula</i> , Mich., . . . . .	. . . . .	Cherty Limestone,	Dry barren.
<i>A. tuberosa</i> , L., ⁷	Pleurisy root, . . . . .	. . . . .	Prairies and fields.
* <i>A. verticillata</i> , L., . . . . .	. . . . .	Sandy,	Dry hills.
<i>Apocynum</i> , Tour.,	Dogbane.		
<i>A. cannabinum</i> , L., . . . . .	. . . . .	. . . . .	Thickets and roads, &c.
<i>Acerates</i> , Ell.,	Green Milkweed.		
* <i>A. viridiflora</i> , Ell., . . . . .	. . . . .	Sand,	Fields and dry hills.

¹ A poisonous plant introduced from Asia. Children have died from eating the seeds. The Tobacco, *Nicotiana rustica* and *N. tabacum*, are found around the plantation in woods and rich land.

² All the plants of this family have in their stems, leaves, and roots a very bitter principle, which makes them useful as tonic, stomachic, and febrifuge remedies.

³ Roots used as tonic and stomachic remedy. The four-angled stem, about one foot high, has opposite oval and acute leaves, and deep rose-purple showy flowers, wheel-shaped, with five or six divisions. Common.

⁴ Fine blue or white funnel-form flowers, the last of the prairie flowers in the fall with the compositæ. Root very bitter.

⁵ Not common in Arkansas. A specimen was brought to me at Fayetteville as a great remedy against the Piles! It is bitter and tonic, nothing else.

⁶ Some exotic species are used in medicine, but none of our American species.

⁷ A fine species, with long grapes of orange flowers. Common on the prairies. Its name, Pleurisy root, comes from the sudorific property of its root, which is used in Pleurisy to excite the perspiration.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
*A. paniculata, Dec.,	Sand,	. . Barren. Nutt. Cat.
*A. longifolia, Ell.,	"	. . Moist. Fort Smith.
<i>Ensenia</i> , Nutt.			
E. albida, Nutt., River banks.
<i>Gonolobus</i> , Mich.			
G. macrophyllus, River banks? (M. Cox.)

Oleaceæ.¹ Olive Family.

<i>Olea</i> , Tour.,	. . . . .	Olive.	
*O. Americana, L., ²	. Devil-wood.	. . . . .	Sand, . . Nutt. Cat.
<i>Chionanthus</i> , L.,	. . . . .	Fringe-tree.	
? C. Virginica, L.,	. . . . .		Sandstone? . . River banks.
<i>Fraxinus</i> , L.,	. . . . .	Ash.	
F. Americana, L., ³	. White ash,	. . . . .	. . Rich woods.
F. viridis, Mich.,	. Green ash,	. . . . .	Limestone, . . Banks of streams.
F. sambucifolia, Lam.,	. Black ash, ⁴	. . . . .	" . . Swamps and banks.
*F. quadrangulata, Mich.,	Blue ash,	. . . . .	" . . Moist rich woods.
*F. platycarpa, Mich.,	. Caroline water ash,	. . . . .	. . Wet woods.
<i>Forestiera</i> , Poir.			
F. acuminata, Poir.,	. . . . .	Limestone,	. . Banks of White River.
*F. pubescens, Nutt.,	. . . . .		. . Plains of Red River.

Aristolochiaceæ.⁵ Birthwort Family.

<i>Asarum</i> , Tour.,	. . . . .	Asarabacca.	
A. Canadense, L., ⁶	. . . . .		Sandstone, . . Rich woods and hillsides.
<i>Aristolochia</i> , Tour.,	. . . . .	Birthwort.	
A. serpentaria, L., ⁷	. Virginia Snakeroot,	Limestone,	. . Woods and rocks.
*A. tomentosa, Sims.,	. . . . .		. . Rich woods.

Nyctaginaceæ. Four O'Clock Family.

<i>Oxibaphus</i> , Vahl.			
*O. nyctagineus, Sweet.,	. . . . .	Limestone,	. . Rocky places.
*O. angustifolius, Sw.,	. . . . .		. . Nutt. Cat.
O. albidus, Sweet.,	. . . . .	Magnesian Limest.,	Barrens.

¹ Trees with bitter and astringent bark.

² Wood compact, fine-grained, extremely hard, and difficult to split. Hence its name. It grows ordinarily near the coasts, but is mentioned in Nuttall's catalogue as found in Arkansas.

³ Wood tough, hard, and elastic. Especially used by wagonmakers and for agricultural implements. Extensively exported to Europe for the use of the navy. The exudation of the bark of the White Ash is used as a lenient purgative. All the species have the same property, and the wood is also of the same kind.

⁴ Wood very tough, easily separated in thin layers for making baskets, &c.

⁵ Roots bitter, tonic, stimulating, of no well-defined properties.

⁶ An Indian medicine. Its bitter root is known as Wild Ginger. It has probably some stimulating property.

⁷ Easily known by its peculiar flower, placed near the root, and with the tube of the corolla curved like a pipe. Root aromatic and stimulant. Has been used against the bite of snakes.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Phytolacaceæ. Pokeweed Family.			
<i>Phytolacca</i> , Tour., .	. Pokeweed.		
<i>P. decandra</i> , L., ¹ .	. Poke. Garget. Pigeon Berry,	. .	Rich soil.
<i>Rivinia</i> , Plum.			
* <i>R. portulacoides</i> , Nutt.,	. . . .	Alluvial, . .	Verdigris River.
Chenopodiaceæ.² Goosefoot Family.			
<i>Chenopodium</i> , L., .	. Pigweed.		
* <i>C. hybridum</i> , L., .	. Maple-leaved goosefoot,	. . . .	Waste places. (Introd)
<i>C. album</i> , L., .	. Lambs' quarters,	. . . .	" "
<i>C. ambrosioides</i> , L., & var.	Wormseed,	. . . .	" "
<i>Atriplex</i> , Tour., .	. Orache.		
* <i>A. hortensis</i> , L., .	. . . . .	. . . . .	Cultivated. (Nutt. Cat.)
<i>Chenopodina</i> , Moq.,	. Sea goosefoot.		
* <i>C. maritima</i> , Moq.,	. . . . .	. . . . .	Salt marshes. "
Amaranthaceæ.³ Amaranth Family.			
<i>Amaranthus</i> , Tour., .	. Amaranth.		
* <i>A. hybridus</i> , L., .	. . . . .	. . . . .	Waste places. (Introd.)
* <i>A. albus</i> , L., .	. . . . .	. . . . .	" "
<i>Montelia</i> , Moq.			
* <i>M. tamariscina</i> , Nutt., .	. . . . .	Sand,	Banks of Arkansas River.
<i>Iresine</i> , P. Br.			
<i>I. celosioides</i> , L., .	. . . . .	Alluvial, . .	Shady rich soil.
<i>Froelichia</i> , Moench.			
* <i>F. floridana</i> , Moq.,	. . . . .	. . . . .	Nutt. Cat.
<i>Achyranthes</i> , Ell.			
* <i>A. repens</i> , Ell., .	. . . . .	. . . . .	Waste places.
* <i>A. lanuginosa</i> , Nutt., .	. . . . .	. . . . .	Salt River.
Polygonaceæ.⁴ Buckwheat Family.			
<i>Polygonum</i> , L., .	. Knotweed.		
<i>P. amphibium</i> , L., .	. Water Persicaria,	Limestone, .	Springs. Mammoth Spg.
<i>P. hydropiperoides</i> , Mich.,	Water-Pepper,	"	Creeks and swamps.

¹ Species known everywhere. A poisonous plant, especially the roots. Leaves and berries dangerous and violent purgative. The berries infused in brandy are used in cases of chronic Rheumatism resulting from syphilitic diseases. (Barton.) The thickened sap of the berries is also used against scrofulas, and even is said to have cured Cancer. The young shoots of the plant in spring lose their acridity by boiling, and are said to be better than asparagus.

² Mostly introduced weeds. The leaves and roots of some of them—the Spinac (*Spinacia oleracea*), the Beet (*Beta vulgaris*)—give a wholesome food. Those growing near the sea contain Soda, which is obtained from their ashes.

³ Mostly introduced weeds.

⁴ In this family, we find plants with bitter, aromatic, and purgative roots, like the Rhubarb; or with pleasant acid and wholesome stems and leaves, like the stems of the Rhubarb and the leaves of the Sorrel. Some have mealy seeds, as the Buckwheat (*Fagopyrum esculentum*). One of our very common species, the Knot-grass or door-weed (*Polygonum aviculare*), has the seeds emetic and purgative. I have not seen the Buckwheat in Arkansas.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
*P. hirsutum, Walt,	.	Sand,	Barren. (Nutt. Cat.)
P. aviculare, L.,	Knot-grass,	"	Waste places.
*var. erectum, Roth.,	.	.	Prairies.
*P. tenue, Mich,	.	Sand,	Dry soil. Rocky hills.
*P. articulatum, L.,	Joint-weed,	"	" (Nutt. Cat.)
*P. Virginianum, L.,	.	.	Rich soil. Thickets, &c.
P. Sagittatum, L.,	Tear-Thumb,	.	Low rich ground.
*P. convolvulus, L.,	.	.	Cultivated. (Nutt. Cat.)
P. dumetorum, L.,	Climbing Buckwheat,	.	Moist thickets, &c.
<i>Rumex</i> , L.,	Dock-Sorrel.	.	
*R. verticillatus, L.,	Swamp-Dock,	.	Swamps and ditches.
R. crispus, L.,	Curled-Dock,	.	Waste places. (Introd.)
*R. maritimus, L.,	Golden-Dock,	Sand,	Saline soil. (Nutt. Cat.)
R. acetosella, L.,	Sheep-Sorrel,	.	Old fields.
<i>Brunnichia</i> , Banks.			
*B. cirrhosa, B.,	.	Sand,	Banks of rivers.
<i>Eriogonum</i> , Mich.			
E. longifolium, Nutt.,	.	Limestone,	Barrens.
*E. annuum. Nutt.,	.	.	Salt River.

Lauraceæ.¹ Laurel Family.

<i>Sassafras</i> , Nees.,	Sassafras.		
S. officinale, Nees., ²	"	Limestone,	Rich woods, borders of
<i>Benzoin</i> , Nees, ³	Wild allspice.		[prairies.
B. odoriferum, Nees.,	"	Lime, alluvial, & rocks,	Rich soil, marshy woods.

Thymeleaceæ.

<i>Dirca</i> , L,	Leatherwood.		
D. palustris, L., ⁴	.	.	Damp, rich woods.

Santalaceæ. Sandal-wood Family.

<i>Comandra</i> , Nutt.,	Bastard Toad-flax.		
*C. umbellata, Nutt.,	"	.	Dry ground.
<i>Pyrolaria</i> , Mich.			
*P. oleifera, Gray,	.	.	Rich wood banks.

Loranthaceæ. Mistletoe Family.

<i>Phoradendron</i> , Nutt.,	Mistletoe.		
P. flavescens, Nutt.,	.	.	Parasite on trees.

¹ Trees or shrubs with aromatic wood, bark, and leaves. This property is especially marked in the Cinnamomum. Camphor is the Gum of a Laurel. The greatest number of species are tropical.

² This shrub is known by everybody. The bark and leaves have an aromatic taste, and are used in infusion as a stimulating drink. Michaux says that its wood is never attacked by insects, and recommends it for making bedsteads.

³ It was employed as Spice during the American War, being, like the former, strongly aromatic, but less common.

⁴ The bark of this species is acrid, fibrous, and very tough. It was used by the Indians for thongs, hence the popular name. (Gray.)

LATIN NAMES.	ENGLISH NAMES.	GEOLOG'L STATION.	NATURAL HABITAT.
Saururaceæ.			
<i>Saururus</i> , L.,	Lizard's tail.		
<i>S. cernuus</i> , L.,		Limestone,	Ponds and bayous.
Ceratophyllaceæ.			
<i>Ceratophyllum</i> ,	Hornwort.		
<i>C. demersum</i> , L.,			Ponds and bayous.
Callitrichaceæ.			
<i>Callitriche</i> , L.,	Water Starwort.		
<i>C. verna</i> , L.,		Limestone,	Springs.
* <i>C. pedunculata</i> , D C.,			Nutt. Cat.
<i>C. autumnalis</i> , L.,		Limestone,	Mammoth Spring.
* <i>C. peploides</i> , Nutt.,			Banks of Mississippi.
Euphorbiaceæ.¹ Spurge Family.			
<i>Euphorbia</i> , L.,	Spurge.		
? <i>E. polygonifolia</i> , L.,		Sand,	Banks.
* <i>E. herniarioides</i> , Nutt.,		"	Banks of Mississippi R.
<i>E. maculata</i> , L.,		"	Dry open places.
<i>E. hypericifolia</i> , L.,		"	Dry prairies.
* <i>E. cyathophora</i> , Jacq.,			Nutt. Cat.
<i>E. corollata</i> , L.,		Limestone,	Dry rocky prairies.
* <i>E. obtusata</i> , Pursh.,			Shady fertile woods.
* <i>E. graminifolia</i> , Mich.,			Nutt. Cat.
* <i>E. arenaria</i> , Nutt.,		Sand,	Arkansas River.
* <i>E. heterantha</i> , Nutt.,		"	" "
* <i>E. peploides</i> , Nutt.,			Fort Smith.
* <i>E. marginata</i> , Nutt.?		Sand,	Arkansas River.
<i>Cnidoscolus</i> , Pohl,	Spurge-Nettle.		
* <i>C. stimulosa</i> , Gray,		Sand,	Banks. (Nutt. Cat.)
<i>Acalypha</i> , L.,	Three-seeded Mercury.		
<i>A. Virginica</i> , L.,		Limestone,	Fields and prairies.
<i>A. gracilens</i> , Gray,		Limestone,	Barrens and rocky places.
<i>Tragia</i> , Plum.			
<i>T. urticæfolia</i> , Mich.,		Limestone,	Rocky barren.
* <i>T. angustifolia</i> , Nutt.,			Red River. Plains.
* <i>T. betonicæfolia</i> , Nutt., ²			" "
<i>Stillingia</i> , Gard.			
<i>S. lanceolata</i> , Nutt.,			Fort Smith, &c.
<i>Croton</i> , L.			
<i>C. capitatum</i> , Mich.,		Limestone,	Barrens.
* <i>C. glandulosum</i> , L.,			Open waste places.
<i>C. monanthogynum</i> , Mich.,		"	Barrens.
* <i>C. muricatum</i> , Nutt.,			Nutt. Cat.

¹ All the plants of this family have a milky, acrid, and caustic sap, which is sometimes poisonous, taken internally. By external application, it is used as a caustic for destroying the warts of the skin. Some exotic species are used in medicine.

² Perhaps both these species are only varieties of *Tragia urens*, L.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Aphora</i> , Nutt.			
* <i>A. mercurialina</i> , Nutt.,	. . . . .	. . . . .	Red River plains.
<i>Phyllanthus</i> , L.			
<i>P. Caroliniensis</i> , Walt.,	. . . . .	Limestone,	Banks.
Urticaceæ.¹ Nettle Family.			
<i>Ulmus</i> , L.,	Elm.		
<i>U. fulva</i> , Mich., ² . . . . .	. . . . .	. . . . .	Rich woods.
<i>U. Americana</i> , L., ³ . . . . .	. . . . .	Limestone,	Moist rich soil and gravel.
<i>U. alata</i> , Mich., ⁴ . . . . .	. . . . .	" . . . . .	Everywhere.
<i>U. crassifolia</i> , Nutt., . . . . .	. . . . .	" . . . . .	Rocks and prairies.
<i>Celtis</i> , Tour.,	Nettle-tree. Hackberry.		
<i>C. occidentalis</i> , L., ⁵	Sugarberry,	Alluvial,	Rich moist soil.
<i>C. Mississipiensis</i> , Bosc., . . . . .	. . . . .	Sand,	Banks and barren.
<i>Morus</i> , Tour.,	Mulberry.		
<i>M. rubra</i> , L., ⁶ . . . . .	. . . . .	Limestone,	Banks and rich woods.
<i>Urtica</i> , Tour.,	Nettle.		
* <i>U. gracilis</i> , Ait., . . . . .	. . . . .	. . . . .	Moist ground. (Nutt. Cat.)
* <i>U. urens</i> , L., . . . . .	. . . . .	. . . . .	Waste ground. "
* <i>U. purpurascens</i> , Nutt., . . . . .	. . . . .	Alluvial,	Shady, rocky places.
<i>Laportea</i> , Gaud.,	Wood-Nettle.		
<i>L. Canadensis</i> , Gaud., . . . . .	. . . . .	Limestone,	Moist rich woods.
<i>Boehmeria</i> , Jacq.,	False Nettle.		
* <i>B. cylindrica</i> , Willd., . . . . .	. . . . .	. . . . .	Woods. (Nutt. Cat.)
<i>Parietaria</i> , Tour.,	Pellitory.		
* <i>P. Pennsylvanica</i> , Muhl., . . . . .	. . . . .	. . . . .	Shaded banks.
<i>Cannabis</i> , Tour.,	Hemp.		
<i>C. sativa</i> , L., ⁷ . . . . .	. . . . .	Limestone,	Gravelly banks, waste [places, &c.
<i>Humulus</i> , L.,	Hop.		
<i>H. Lupulus</i> , L., ⁸ . . . . .	. . . . .	Limestone,	Banks of streams.
Platanaceæ.			
<i>Platanus</i> , L.,	Plane-tree. Buttonwood.		
<i>P. occidentalis</i> , L., ⁹	Sycamore. "	Alluvial,	Rich banks.

¹ Plants very different in size, forms, and properties. Some are poisonous to the highest degree. Some, like the Fig-tree, bear wholesome fruits; some, like the Pepper, have aromatic berries; some a fine wood, like our Elms; and some a tough flexible bark, like the Hemp, the Nettle, &c.

² A small tree, with mucilaginous inner bark, eaten by children and used as emollient in infusion. The heart wood is of a dull red color, less compact than that of the following species.

³ Wood dark brown, very strong, but easily decaying. It attains a great size.

⁴ Most common in Arkansas, but mostly a shrub. Grows everywhere, and on every kind of soil.

⁵ According to Michaux, the wood is but little esteemed. When perfectly seasoned, it is hard, compact, and tenacious.

⁶ A small tree. Wood durable, strong, valuable for making posts. Its leaves have been used, like those of the White mulberry, for the food of the silk-worms.

⁷ The Hemp is scarcely cultivated in Arkansas, being replaced by cotton. It needs for its culture a good, deep, fertile soil, or a bottom land not too retentive of water. The use of its bark is well known. From its leaves and flowers is made the Hachichin, a preparation which acts on the body like opium, causing a kind of delirious drunkenness which enervates and kills like a slow poison.

⁸ Cultivated in gardens and escaped. Its use is well known.

⁹ Tree very large. Wood of but little value.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Juglandaceæ.			
<i>Juglans</i> , L., . . .	Walnut.		[(rare).
<i>J. cinerea</i> , L., ¹ . . .	Butternut, . . .	Alluvial, . . .	Rich woods and bottoms
<i>J. nigra</i> , L., ² . . .	Black Walnut, . . .	" . . .	" " (common).
<i>Carya</i> , Nutt., . . .	Hickory.		
<i>C. olivæformis</i> , Nutt., ³ . . .	Pecan nut, . . .	Alluvial, . . .	Deep bottoms near Miss.R.
<i>C. alba</i> , Nutt., ⁴ . . .	Shell-bark Hickory.	Sandstone, . . .	Rich woods.
<i>C. sulcata</i> , Nutt., . . .	Thick Shell-bark Hickory,	" . . .	" (rare).
<i>C. tomentosa</i> , Nutt., . . .	Mockernut, . . .	Limestone, &c.,	Dry rocky woods, &c.
<i>C. glabra</i> , Tor., . . .	Pig-nut, . . .	Sandstone, . . .	Hickory barrens.
* <i>C. amara</i> , Nutt., ⁵ . . .	Bitternut, . . .	Alluvial, . . .	Swamps and woods.
* <i>C. aquatica</i> , Nutt., . . .	. . . . .	" . . .	"

Cupuliferæ. Oak Family.

<i>Quercus</i> , Mich., . . .	Oak.		
<i>Q. macrocarpa</i> , Mich., ⁶ . . .	Over-cup or Bur-oak,	Alluvial Lime., . . .	Rich banks (rare).
<i>Q. obtusiloba</i> , Mich., ⁷ . . .	Post-oak, . . .	Sand and lime, &c.,	Dry barren, sterile soil.
<i>Q. alba</i> , L., ⁸ . . .	White oak, . . .	" "	On every soil.
<i>Q. prinus</i> , L., ⁹ . . .	Swamp Chestnut-oak,	Alluvial, . . .	Low ground.
<i>Q. montana</i> , Willd., ¹⁰ . . .	Rock Chestnut-oak,	Sandst. & Limest.,	Rocky creeks.
<i>Q. bicolor</i> , Willd., ¹¹ . . .	Swamp White-oak, . . .	Alluvial, . . .	Bottoms of Washita River.
<i>Q. Castanea</i> , Willd., ¹² . . .	Yellow Chestnut-oak,	Limestone, . . .	Banks of rivers (rare).
* <i>Q. prinoides</i> , Willd., ¹³ . . .	Chinquapin Oak, . . .	Sandy, . . .	Barrens.
<i>Q. lyrata</i> , Walt., ¹⁴ . . .	Over-cup Oak, . . .	Alluvial, . . .	Bottoms in marshy places.

¹ Wood light, of little strength, but durable and resisting the effects of heat, moisture, &c. Used for window sashes. Michaux says that its bark is purgative. The fruits, gathered before maturity, are preserved in sugar, or infused in brandy as an excellent stomachic and tonic.

² Wood becoming black by seasoning, strong, very tenacious, fine-grained, susceptible of a fine polish. Much used for cabinet-work, and as fine as mahogany.

³ The nut is known everywhere. Wood coarse-grained, heavy, compact, durable, but not as valuable as other species of Hickory.

⁴ The wood of this species, says Michaux, possesses all the characteristic properties of the Hickory, being strong, elastic, and tenacious. It has also the common defects of soon decaying and being eaten by worms.

⁵ The timber of this species is inferior to the other species. It is generally a small tree.

⁶ Stiff, durable wood, as good for fuel as the white oak. It is rare in Arkansas; at least I saw very few specimens of it on our way.

⁷ A small tree. Hard, durable wood, valuable for posts. Most common in Arkansas.

⁸ One of our most valuable species of trees, becoming very large on a good alluvial or rich limestone soil. Wood hard, durable, much used for different purposes. Its bark is tonic, astringent, and used in medicine. Variable in size, following the ground which it inhabits.

⁹ A fine large tree. Its wood is inferior to the White Oak. (Gray.)

¹⁰ It follows the rocky creeks and torrents where no other tree can grow. A small tree, considered a variety of the former; but I could not find it passing to it either in station or in form.

¹¹ Not common. A fine large tree, branching high above the ground. Named in Arkansas, Swamp-Burr Oak.

¹² Acorns small, scarcely larger than a pea. I saw it only on limestone banks near White River. It is common enough east of the Mississippi.

¹³ Only a shrub. I did not see it in Arkansas.

¹⁴ A fine large tree, one of the largest and most highly estimated among the Oaks (says Michaux). It grows in deep, marshy bottoms, near shallow creeks, in the same habitat as the Cypress and the great Tupelo. Scarce in Arkansas, at least in the upper region. Seen only near Washita River.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Q. Phellos</i> , L., ¹	. Willow oak, . . .	Alluvial, . . .	Bottoms in marshy places.
<i>Q. imbricaria</i> , Mich., ²	. Laurel or shingle-oak,	Limestone, . . .	Banks and high bottoms.
<i>Q. aquatica</i> , Cat., ³	. Water oak, . . .	Alluvial, sandy,	Bottoms and flats.
<i>Q. nigra</i> , L., ⁴	. Black-Jack oak, . . .	Sand and lime, . . .	Barren.
<i>Q. falcata</i> , Mich., ⁵	. Spanish oak, . . .	Sandstone, . . .	Dry sandy plains & ridges.
<i>Q. tinctoria</i> , Bart., ⁶	. Black oak, Quercitron,	Sand and lime, . . .	Plains and ridges.
<i>Q. coccinea</i> , Wang., ⁷	. Scarlet oak, . . .	" "	Hills and rich woods.
<i>Q. rubra</i> , L., ⁸	. Red oak, . . .	" "	Rocky woods, creeks, &c.
<i>Q. palustris</i> , D. R., ⁹	. Pin oak, . . .	Alluvial, . . .	Low ground, borders of [swamps & prairies.
<i>Castanea</i> , Tour., . . .	. Chestnut.		
<i>C. vesca</i> , L., ¹⁰	. " . . .	Sandstone & chert,	Rocky hills (rare).
<i>C. pumila</i> , Mich., ¹¹	. Chinquapin, . . .	" . . .	" (common).
* <i>C. nana</i> , Muhl., . . .	. Dwarf Chinquapin,	" . . .	Hills of Arkansas River.
<i>Fagus</i> , Tour., . . .	. Beech.		
<i>F. sylvestris</i> , Mich., ¹²	. White Beech, . . .	Alluvial & tertiary,	Washita River and South- [ward.
<i>Corylus</i> , Tour., . . .	. Hazel-nut.		
<i>C. Americana</i> , Walt., . . .	. " . . .	Sandy, . . .	Thickets around prairies.
<i>Carpinus</i> , L., . . .	. Hornbeam.		
<i>C. Americana</i> , Mich., ¹³	. " . . .	Limestone, . . .	Banks and creeks.
<i>Ostrya</i> , Mich., . . .	. Iron wood.		
<i>O. Virginica</i> , Willd., . . .	. . . . .	" . . .	" "

¹ Abounds from Hurricane Creek southward, in all the swampy bottoms and flats, where it bears abundance of acorns. Wood reddish, coarse-grained, porous, not much used.

² Pretty rare in Arkansas. Wood hard, heavy, fit for fuel only. Has been used for shingles. (Michaux.)

³ It ranges from Sebastian County, or rather from Fort Smith to Memphis, or from this parallel southward. I did not see it north of this line. The tree becomes of good size, more than fifty to sixty feet high. Its leaves are extremely variable, showing all possible forms between the Willow and the Post-oak leaves, even sometimes cut and spiny. Wood very tough (says Michaux), but less durable and less estimated by carpenters and wheelwrights than that of the White Oak.

⁴ A small crooked tree. Wood compact, coarse-grained, good for fuel.

⁵ Becomes a large tree in deep sandstone soil. In barren sandstone it is mostly stunted, and pass to *Quercus tridentata*, Engl. Wood less durable, and less estimated than that of the White Oak. Bark preferable for tanning

⁶ A large tree, with reddish, strong, durable wood. The Quercitron is a yellow coloring matter, obtained from the cellular or inner bark of this tree.

⁷ Grows with the former species. Wood not as good. Used for staves. Poor for fuel. It is easily distinguished from the next by its scaly acorns.

⁸ It likes limestone and lime soil; very common in Arkansas, and found at various stations. Easily distinguished by its large acorns and flat shallow cup. Wood reddish, strong, porous, not very valuable. Bark used for tanning.

⁹ The foliage is most like that of the former; but its acorn is globular, and scarcely half as long. Wood strong, tenacious, not durable. Used for staves.

¹⁰ I did not see in Arkansas a tree of good size of this species, but only shrubby. Wood strong, elastic, durable, good for posts, &c.

¹¹ The Chinquapin is more common in Arkansas than the Chestnut. Its wood is still stronger and more compact.

¹² Becomes of enormous size in the bottoms in rich deep soil, not too wet. Wood too hard and too heavy for timber, but very good for fuel.

¹³ A slender tree like the next, with white, compact, hard wood. Both this and next species have also the same kind of wood, and are generally known under the name of Iron-wood. Its fruit is inclosed in a ring of loose catkin, while that of the next species has the seed enveloped and bordered with a leaflike, cut calyx.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Myricaceæ. Sweet Gale Family.			
<i>Myrica</i> , L., . . .	Bayberry.		
<i>M. cerifera</i> , L., ¹ . . .	" . . .	Sandy, . . .	Alluvial swampy ground.
Betulaceæ. Birch Family.			
<i>Betula</i> , Tour., ² . . .	Birch.		
* <i>B. populifolia</i> , Ait., . . .	White Birch, . . .	Sandstone, . . .	Barren. (Nutt. Catt.)
<i>B. nigra</i> , L., . . .	Red Birch, . . .	" . . .	River banks.
<i>Alnus</i> , Tour., . . .	Alder.		
<i>A. serrulata</i> , Ait., . . .	Smooth Alder, . . .	Limestone, . . .	Gravel & banks of creeks.
Salicaceæ.			
<i>Salix</i> , Tour., . . .	Willow.		
<i>S. discolor</i> , Muhl., . . .	Glaucous Willow,		River banks.
<i>S. nigra</i> , Marsh., . . .	Black Willow,		" "
* <i>S. longifolia</i> , Muhl.,			Nutt. Cat.
<i>Populus</i> , Tour., . . .	Poplar.		
<i>P. monilifera</i> , Ait., ³ . . .	Cotton-wood, . . .	Alluvial sandy, . . .	Bottoms along rivers.
* <i>P. angulata</i> , Ait.,		" . . .	Low grounds.
Coniferæ. Pine Family.			
<i>Pinus</i> , Tour., . . .	Pine.		
* <i>P. inops</i> , Ait., . . .	Jersey Pine, . . .	Sandstone, . . .	Barren. (Nutt. Cat.)
<i>P. mitis</i> , Mich., ⁴ . . .	Yellow Pine of the North, . . .	Sandstone & chert, . . .	Barren hills (common).
* <i>P. rigida</i> , Mill., ⁵ . . .	Pitch Pine, . . .	Sand, . . .	Nutt. Cat.
<i>P. Tæda</i> , L., ⁶ . . .	Loblolly Pine, . . .	Tertiary, . . .	Alluvial and sandy hills.
<i>Taxodium</i> , Rich., . . .	Bald Cypress.		
<i>T. distichum</i> , Rich., ⁷ . . .	" . . .	Alluvial, . . .	Deep swamps.
<i>Juniperus</i> , L., . . .	Juniper.		
<i>J. Virginiana</i> , L., ⁸ . . .	Red Cedar, . . .	Limestone, . . .	Banks of rivers, rocks. Mouth of Benetz Bayou.
Araceæ. Arum Family.			
<i>Arisæma</i> , Mart., . . .	Indian turnip.		
* <i>A. triphyllum</i> , Tor.,			Rich soil and woods.
* <i>A. Dracontium</i> , Schott,			Low ground.
<i>Acorus</i> , L., . . .	Sweet flag. Calamus.		
<i>A. Calamus</i> , L., ⁹	"		Swampy prairies.

¹ The berries are invested with a kind of wax, which, collected by boiling, is used for candle-making.
² The wood of the Birches is not very valuable. It is soft and light.
³ Wood white, soft, unfit for use. I have not seen this tree in Arkansas, except with the Arkansas River bottoms and the creeks running to it across the Millstone grit, Frog bayou, &c. None in the north of the State.
⁴ Wood fine-grained, a little resinous, yellowish white, used for flooring, &c.
⁵ I have not seen it in Arkansas. It is the most valuable Yellow Pine of the South.
⁶ Grows south of Hot Springs County, mixed with the Yellow Pine, and is used for the same purpose, though not as good.
⁷ Wood fine-grained, reddish, strong, elastic, and less resinous than that of the Pines. Much used for building in the South, and very valuable.
⁸ Wood reddish, odorous, strong, tough, and durable. The species is rare in Arkansas.
⁹ Root creeping, sweet-scented, aromatic, and somewhat tonic. It is highly praised as a valuable popular medicine, but its properties are scarcely ascertained.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
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Typhaceæ. *Cat-tail Family.*

<i>Typha</i> , Tour., . . .	Cat-tail flag.		
<i>T. latifolia</i> , L., . . .	"		Ponds and bayous.
<i>Sparganium</i> , Tour., . . .	Bur-reed.		
<i>S. simplex</i> , Huds., . . .		Limestone springs,	Mammoth Spring.

Lemnaceæ. *Duckweed Family.*

<i>Lemna</i> , L., . . .	Duck meat.		
<i>L. trisulea</i> , L., . . .	"	Floating, . . .	Mammoth Spring.
<i>L. minor</i> , L., . . .	"	"	" "
* <i>L. polyrrhiza</i> , L., ¹ . . .	"	"	Nutt. Cat.

Palmæ. *Palms.*

<i>Sabal</i> , Adans., ² . . .	Palmetto.		[Arkansas River.
<i>S. Adansonii</i> , Guer., . . .	"	Alluvial, . . .	Deep marshes mouth of

Naiadaceæ. *Pondweed Family.*

<i>Zannichellia</i> , Mich., . . .	Horned Pondweed.		
<i>Z. palustris</i> , L., . . .	"		Mammoth Spring.
<i>Potamogeton</i> , Tour., . . .	Pondweed.		
<i>P. compressus</i> , L., . . .			" "
<i>P. prælongus</i> , Wullf., . . .			" "
<i>P. natans</i> , L., . . .			" "
* <i>P. heterophyllus</i> , Schr., . . .			Nutt. Cat.

Alismaceæ. *Water Plantain Family.*

<i>Alisma</i> , L., . . .	Water plantain.		
<i>A. Plantago</i> , L., . . .	" "		Ditches. Ponds.
<i>Echinodorus</i> .			
* <i>E. rostratus</i> , Engl., . . .			Ponds of Verdigris River.
<i>Sagittaria</i> , L., . . .	Arrow-head.		
* <i>S. radicans</i> , Nutt., . . .			Shallow water. Ft. Smith.
* <i>S. variabilis</i> , Engel., . . .			" and wet places.
* <i>S. simplex</i> , Pursh., . . .			" "

Hydrocharidaceæ. *Frog's-bit Family.*

<i>Limnobium</i> , Rich., . . .	Frog's bit.		
<i>L. Spongia</i> , Rich., . . .			Ponds.
<i>Anacharis</i> , Rich., . . .	Water weed.		
<i>A. Canadensis</i> , Pl., . . .	"		Mammoth Spring.
<i>Valisneria</i> , Mich., . . .	Eel-grass.		
* <i>V. spiralis</i> , L., . . .			Slow rivers. (Nutt. Cat.)

¹ *Lemna perpusilla*, Torr., is also probably a species of Mammoth Spring. I could not find it in fruit.

² M. Nuttall says that this Palm first makes its appearance a few miles below the Southern boundaries of the Arkansas Territory, on the banks of the Mississippi River. It is now found in abundance at the mouth of Arkansas River, back of the town of Napoleon. Has this species changed its distribution ascending northward, or has it escaped the attention of M. Nuttall, one of the most careful, exact, and attentive explorers?

LATIN NAMES.	ENGLISH NAMES.	GEOLOG'L STATION.	NATURAL HABITAT.
Orchidaceæ. <i>Orchis Family.</i>			
<i>Spiranthes</i> , Rich., . . .	Ladies' Tresses.		
<i>S. annua</i> , Rich., . . .	. . . . .	Chert, . . .	Wet prairies.
<i>Pogonia</i> , Juss.			
* <i>P. pendula</i> , Lindl., . . .	. . . . .	. . . . .	Rich damp woods.
<i>Calopogon</i> , R. Br.			
* <i>C. pulchellus</i> , R. Br., . . .	. . . . .	. . . . .	Bogs.
<i>Tipularia</i> , Nutt., . . .	Cane-fly Orchis.		
* <i>T. discolor</i> , Nutt, . . .	. . . . .	Sandy, . . .	Pine woods. (Nutt. Cat.)
<i>Microstylis</i> , Nutt., . . .	Adder's mouth.		
* <i>M. ophioglossoides</i> , Nutt., . . .	. . . . .	. . . . .	Damp woods.
<i>Cypripedium</i> , L., . . .	Lady's slipper.		
* <i>C. pubescens</i> , Willd., . . .	. . . . .	Sandy, . . .	Woods and hills.

Amaryllidaceæ.

<i>Pancratium</i> , L.			
* <i>P. maritimum</i> , L., . . .	. . . . .	Sand, . . .	Salt marshes. (Nutt. Cat.)
<i>Crinum</i> , L.			
* <i>C. Americanum</i> , L., . . .	. . . . .	Alluvial, . . .	Swamps. " "
<i>Agave</i> , L., . . .	American Aloe.		
<i>A. Virginica</i> , L., . . .	. . . . .	Limestone, . . .	Rocks.
<i>Hypoxis</i> , L., . . .	Star-grass.		
* <i>H. erecta</i> , L., . . .	. . . . .	Sandy, . . .	Open woods.

Hæmodoraceæ. *Bloodwort Family.*

<i>Aletris</i> , L., . . .	Colic root.		
* <i>A. farinosa</i> , L., . . .	. . . . .	Sandy, . . .	Shady places.
* <i>A. aurea</i> , Walt., . . .	. . . . .	Sand, . . .	Barren.

Bromeliaceæ. *Pine-Apple Family.*

<i>Tillandsia</i> , L., . . .	Long Moss.		[Live Oak.
* <i>T. usneoides</i> , L., . . .	. . . . .	. . . . .	On trees, especially the

Iridaceæ. *Iris Family.*

<i>Iris</i> , L., . . .	Flower de Luce. Blue flag.		
* <i>I. versicolor</i> , L., . . .	. . . . .	. . . . .	Wet places.
* <i>I. Virginica</i> , L., . . .	. . . . .	. . . . .	Marshes.
<i>I. cristata</i> , Ait, . . .	. . . . .	Sandstone, . . .	Hills and dry ridges.
<i>Nemastylis</i> , Nutt.			
* <i>N. cœlestina</i> , Nutt., . . .	. . . . .	Sandstone, . . .	Rocky pine woods.
<i>N. geminiflora</i> , Nutt., . . .	. . . . .	" . . .	" "

¹ On this species, Nuttall says that its first appearance along the Mississippi is in the Cypress land near the Southern confines of Arkansas. Scarcely, if ever, found in the State limits.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
Dioscoreaceæ. Yam Family.			
<i>Dioscorea</i> , Plun., . . .	Yam.		
* <i>D. quaternata</i> , Walt.,			Arkansas. (Nutt. Cat.)
Smilaceæ.			
<i>Smilax</i> , Tour., . . .	Greenbrier.		
<i>S. rotundifolia</i> , L.,			Thickets (common).
* <i>S. glauca</i> , Walt.,			Dry thickets.
* <i>S. tamnoides</i> , L.,			Thickets.
<i>S. lanceolata</i> , L.,		Alluvial,	Swamps. Washita River.
<i>S. laurifolia</i> , L.,		Sandy,	Pine barren.
<i>S. herbacea</i> , L.,		Alluvial,	Banks of rivers.
<i>Trillium</i> , L.,	Three-leaved Nightshade.		
* <i>T. sessile</i> , L.,			Woods.
* <i>T. unguiculatum</i> , Nutt.,			Shady woods.
* <i>T. viridescens</i> , Nutt.,			" "
Liliaceæ. Lily Family.			
<i>Polygonatum</i> , Tour., . . .	Solomon's seal.		
* <i>P. biflorum</i> , Ell.,			Wooded banks.
* <i>P. multiflorum</i> , Ell.,			Arkansas. (Nutt. Cat.)
<i>Smilacina</i> , Desf.,	False Solomon's seal.		
* <i>S. racemosa</i> , Desf.,			Moist copses.
* <i>S. stellata</i> , Desf.,			" "
<i>Scilla</i> , L.,	Squill.		
<i>S. Fraseri</i> , Gray, ¹	Quamash,		Thickets & moist prairies.
<i>Allium</i> , L.,	Garlic.		
<i>A. stellatum</i> , Nutt.,			Prairies (rare).
* <i>A. angulosum</i> , B. Nutt.,			Arkansas. (Nutt. Cat.)
* <i>A. ochroleucum</i> , Nutt.,			Prairies. "
* <i>A. Canadense</i> , Kalm.,			Moist prairies.
<i>A. striatum</i> , Jacq.,			Prairies. (M. Cox.)
<i>Lilium</i> , L.,	Lily.		
* <i>L. Philadelphicum</i> , L.,			Prairies and copses.
* <i>L. superbum</i> , L.,		Alluvial,	Rich low ground.
<i>Erythronium</i> , L.,	Dog's-tooth Violet.		
* <i>E. Americanum</i> , Sm.,		Limestone,	Banks and thickets.
* <i>E. albidum</i> , Nutt.,		"	" "
<i>Yucca</i> , L.,	Spanish bayonet.		
* <i>Y. recurvifolia</i> , Salisb.,			Arkansas. (Nutt. Catt.)
Melanthaceæ.			
<i>Uvularia</i> , L.,	Bellwort.		
* <i>U. sessilifolia</i> , L.,			Nutt. Cat.
<i>Melanthium</i> , Gron.			
* <i>M. Virginicum</i> , L.,			Wet meadows.

¹ Bulb sweet to the taste, and eatable.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG'L STATION.	NATURAL HABITAT.
<i>Stenanthium</i> , Gray.			
* <i>S. angustifolium</i> , Gray,	. . . . .	. . . . .	Wet meadows.
<i>Amianthium</i> , Gray,	Fly poison.		
* <i>A. muscætoxicum</i> , Gray,	. . . . .	. . . . .	Open woods.
<i>Helonias</i> , L.			
* <i>H. angustifolia</i> , Mich.,	. . . . .	. . . . .	Fort Smith.
<i>Chamæirium</i> , Willd,	Devil's Bit.		
* <i>C. luteum</i> , Gray,	. . . . .	. . . . .	Low grounds.
<i>Tofieldia</i> , Huds.,	False Asphodel.		
<i>T. glabra</i> , Nutt.,	. . . . .	. . . . .	Prairies.
? <i>T. pubens</i> , Ait.,	. . . . .	Sandy,	Barrens.

Juncaceæ. *Rush Family.*

<i>Luzula</i> , D C,	Wood Rush.		
<i>L. campestris</i> , D C,	. . . . .	. . . . .	Rocky woods.
<i>Juncus</i> , L.,	Rush.		
<i>J. effusus</i> , L.,	. . . . .	. . . . .	Ditches.
* <i>J. setaceus</i> , Rost,	. . . . .	. . . . .	Nutt. Cat.
* <i>J. scirpoides</i> , Lam.,	. . . . .	. . . . .	Borders of streams.
* <i>J. acuminatus</i> , Mich.,	. . . . .	. . . . .	Bogs and ponds.
* <i>J. heteranthos</i> , Nutt.,	. . . . .	. . . . .	Woods.
* <i>J. repens</i> , Mich.,	. . . . .	. . . . .	Nutt. Cat.
<i>J. tenuis</i> , Willd.,	. . . . .	. . . . .	Prairies.
* <i>J. bufonius</i> , L.,	. . . . .	. . . . .	Low grounds.

Pontederiaceæ. *Pickerel-weed Family.*

<i>Pontederia</i> , L.,	Pickerel weed.		
<i>P. cordata</i> , L.,	. . . . .	. . . . .	Shallow water.
<i>Heteranthera</i> , Ruiz.			
* <i>H. limosa</i> , Vahl,	. . . . .	. . . . .	Nutt. Cat.
<i>Schollera</i> , Schreb.,	Water Star-grass.		
<i>S. graminea</i> , Willd.,	"	. . . . .	Shallow streams.

Commelinaceæ. *Spiderwort Family.*

<i>Commelyna</i> , Dill.,	Day flower.		
* <i>C. communis</i> , L.,	. . . . .	Alluvial,	Low ground.
* <i>C. erecta</i> , L.,	. . . . .	"	Shaded banks.
* <i>C. Virginica</i> , L.,	. . . . .	. . . . .	Damp rich woods.
<i>Tradescantia</i> , L.,	Spiderwort.		
* <i>T. Virginica</i> , L.,	. . . . .	. . . . .	Moist woods.
* <i>T. rosea</i> , Vent.,	. . . . .	Sandy,	Woods and banks.

Cyperaceæ. *Sedge Family.*

<i>Cyperus</i> , L.,	Galingale.		
<i>C. flavescens</i> , L.,	. . . . .	Sandy,	Banks.
<i>C. diandrus</i> , Torr.,	. . . . .	"	" Wet places.
* <i>C. Nuttallii</i> , Tor.,	. . . . .	"	" "

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>C. strigosus</i> , L.,		Limestone,	Creeks and bottoms.
<i>C. inflexus</i> , Muhl.,		Sandy,	Banks and gravel.
<i>C. ovularis</i> , Torr.,		"	Woods. Dry places.
* <i>C. retrofractus</i> , Torr.,			Marshy ground.
<i>Kyllingia</i> , L.			
<i>K. pumila</i> , Mich.,		Limestone,	Creeks and banks.
<i>Eleocharis</i> , R. Br.,	Spike-Rush.		
* <i>E. quadrangulata</i> , R. Br.,		Sand,	Nutt. Cat.
* <i>E. palustris</i> , R. Br.,			Low ground. Ditches.
<i>E. acicularis</i> , R. Br.,			Brooks. Mammoth Spring.
* <i>E. pygmæa</i> , Torr.,			Marshes.
<i>Scirpus</i> , L.,			
	Bulrush.		
<i>S. pungens</i> , Vahl.,		Gravelly,	Banks of White River.
* <i>S. lacustris</i> , L.,			Ponds.
<i>Fimbristylis</i> , Vahl.			
<i>F. autumnalis</i> , Roem.,		Sandy,	Banks of Arkansas River.
<i>Fuirena</i> , Rott.,			
	Umbrella-grass.		
<i>F. squarrosa</i> , Mich.,		Limestone,	Springs, mossy ground.
<i>Rhynchospora</i> , Vahl.,			
	Beak-Rush.		
* <i>R. alba</i> , Vahl., ¹			Nutt. Cat.
* <i>R. longirostris</i> , Nutt.,			" "
<i>Scleria</i> , L.,			
	Nut-Rush.		
* <i>S. reticularis</i> , Mich.,		Sandy,	Swamps.
<i>Carex</i> , L., ²			
	Sedge.		
* <i>C. rosea</i> ., Schk.,			Moist woods.
* <i>C. plantaginea</i> , Lam.,			Shady woods.
* <i>C. anceps</i> , L.,			Rocky woods.
* <i>C. flava</i> , L.,			Wet meadows.
* <i>C. tentaculata</i> , Muhl.,			" "
* <i>C. folliculata</i> , L., ³			Peat bogs.
* <i>C. lupulina</i> , Muhl.,			Swamps.

Gramineæ. Grass Family.

<i>Greenia</i> , Nutt.			
* <i>G. Arkansasana</i> , Nutt.,		Limestone,	Hills of Red River.
<i>Leersia</i> , Sol.,			
	False rice.		
<i>L. oryzoides</i> , Sw.,	Rice Cut-grass,		Wet meadows. Mammoth
* <i>L. Virginica</i> , Willd.,	White grass.		[Spring.
<i>Zizania</i> , Gron.,			
	Indian rice.		
<i>Z. aquatica</i> , L., ⁴	Water oats,		Swamps, &c. Mam. Spring.
* <i>Z. miliacea</i> , Mich.,			" "

¹ Though this species is enumerated in Nuttall's Catalogue, I doubt that it belongs to Arkansas.

² Of this genus, which in the Southern States contains seventy-five species at least, M. Nuttall mentions only seven species in his catalogue, with this remark: "and many others." As late in the autumn, when I visited Arkansas, the species of this genus have entirely disappeared, the catalogue is of course incomplete for the genus *Carex*. Most of the species enumerated in Chapman's Southern Flora belong also to Arkansas. I have copied only the short list of M. Nuttall.

³ Rather a Northern species. Can scarcely be found in Arkansas.

⁴ Appears rare in Arkansas. It is greedily eaten by cattle, but generally grows in too deep water. Its grain is gathered by the Indians and used for food.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG'L STATION.	NATURAL HABITAT.
<i>Alopecurus</i> , L.			
* <i>A. geniculatus</i> , L.,			Moist meadows.
<i>Vilfa</i> , Ad.,	Rush-grass.		
* <i>V. aspera</i> , Beauv.,		Sandy,	Fields.
<i>V. vaginæflora</i> , Torr.,		"	Barren.
<i>Sporobolus</i> , R. Br.			
? <i>S. Indicus</i> , Brown,			Wet places.
<i>Agrostis</i> , L.,	Bent grass.		
* <i>A. perennans</i> , Tuck.,			Damp shaded places.
* <i>A. scabra</i> , Willd.,		Sandy,	Dry places.
* <i>A. vulgaris</i> , With., ¹	Red-top grass,		Meadows.
* <i>A. arachnoides</i> , Ell.,			High prairies.
<i>Polypogon</i> , Desf.,	Beard-grass.		
* <i>P. racemosum</i> , Nutt.,			Nutt. Cat.
<i>Cinna</i> , L.,	Wood reed-grass.		
* <i>C. arundinacea</i> , L.,			Damp woods.
<i>Muhlenbergia</i> , Schreb.,	Drop seed grass.		
<i>M. Mexicana</i> , Trin.,			Low ground.
<i>M. diffusa</i> , Schreb.,		Sandy,	Hills and woods.
<i>Calamagrostis</i> , Adan.,	Reed Bent grass.		
<i>C. Canadensis</i> , Beauv.,		"	Shady banks.
* <i>C. gigantea</i> , Nutt.,		"	Banks of Salt River.
<i>Stipa</i> , L.,	Feather grass.		
* <i>S. sericea</i> , Mich.,			Nutt. Cat.
* <i>S. parviflora</i> , Mich.,			" "
* <i>S. avenacea</i> , L.,		Sandy,	Woods.
<i>Aristida</i> , L.,	Triple-awned grass.		
<i>A. gracilis</i> , Ell.,		Sandstone,	Prairies and hills.
* <i>A. dichotoma</i> , Mich.,			Old fields.
<i>A. stricta</i> , Mich.,		Sandy,	Prairies.
* <i>A. oligantha</i> , Mich.,			Nutt. Cat.
* <i>A. pallens</i> , Nutt.,			" "
* <i>A. purpurea</i> , Nutt.,		Sandy,	Plains of Red River.
<i>A. tuberculosa</i> , Nutt.,		"	Prairies.
<i>Spartina</i> , Schr.,	Cord or Marsh grass.		
* <i>S. cynosuroides</i> , Willd.,			Banks of rivers.
* <i>S. polystachya</i> , Willd.,		Sandy,	Brackish marshes.
<i>Ctenium</i> , Panz.,	Toothache grass.		
* <i>C. Americanum</i> , Spr.,		Sand,	Barrens.
<i>Bouteloua</i> , Lag.,	Muskit grass.		
<i>B. curtipendula</i> , Gray,		Limestone,	Hills and barrens.
* <i>B. oligostachya</i> , T. & Gr.,			Nutt. Cat.
<i>Cynodon</i> , Rich.,	Bermuda grass.		
<i>C. Dactylon</i> , Pers.,			Dry fields. (Introduced.)
<i>Eleusine</i> , Gært.,	Crab grass.		
<i>E. Indica</i> , Gært.,			Waste places. "

¹ This species is often cultivated on wet meadows. It is known also under the name of Bent grass. The name of Herd grass, which it bears also sometimes, belongs to *Phleum pratense*. The white Bent grass, *Agrostis alba*, L., was formerly celebrated under the name of Tiorin grass. It is not better grass than this. The hay of the Red top is good, but short and thin.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Leptochloa</i> , Beauv.			
* <i>L. fascicularis</i> , Gray,			Wet meadows.
* <i>L. attenuata</i> , Nutt.,			Nutt. Cat.
<i>Tricuspis</i> , Beauv.			
<i>T. seslerioides</i> , Torr.,		Sandy,	Prairies.
* <i>T. stricta</i> , ? Nutt.,			" Nutt. Cat.
<i>Diarrhena</i> , Raf.			
<i>D. Americana</i> , Beauv.		Limestone,	Rich banks of rivers.
<i>Koeleria</i> , Pers.			
* <i>K. cristata</i> , Pers.,		Sandy,	Hills.
<i>Eatonia</i> , Raf.			
* <i>E. obtusata</i> , Gray,			Dry soil.
<i>Melica</i> , L.,	Melic grass.		
* <i>M. mutica</i> , Walt.,			Nutt. Cat.
<i>Glyceria</i> , R. Br.,	Mauna grass.		
* <i>G. nervata</i> , Trin.,			Moist meadows.
* <i>G. fluitans</i> , R. Br.,			Shallow water.
<i>Poa</i> , L.,	Meadow grass.		
* <i>P. pratensis</i> , L., ¹			Fields. Cultivated.
<i>P. annua</i> , L.,	Low spear grass.		Waste grounds.
* <i>P. nemoralis</i> , L.,			Nutt. Cat.
* <i>P. interrupta</i> , Nutt.,			Bushy prairies.
* <i>P. capitata</i> , Nutt., ²		Sandy,	Banks.
<i>Eragrostis</i> , Beauv.			
<i>E. reptans</i> , Nees.,		Sand,	"
* <i>E. poaeoides</i> , Beauv.,		"	"
* <i>E. pilosa</i> , Beauv.,		"	"
* <i>E. tenuis</i> , Gray,		"	"
* <i>E. capillaris</i> , Nees.,		"	Fields.
* <i>E. pectinacea</i> , Gray,		"	"
* <i>E. conferta</i> , Prin.,		"	Banks.
<i>Festuca</i> , L.,	Fescue grass ³		
* <i>F. tenella</i> , Willd.,		Sandy,	Sterile places.
* <i>F. polystachya</i> , Mich.,			Nutt. Cat.
* <i>F. diandra</i> , Nutt.,			" "
* <i>F. sciurea</i> , Nutt.,			" "
<i>F. elatior</i> , L.,			Cultivated fields.
<i>Bromus</i> , L.,	Brome grass.		
<i>B. ciliatus</i> , L.,		Limestone,	Banks of King's River.

¹ This is the common meadow grass generally cultivated. It grows more or less luxuriantly, according to the richness of the soil, and makes better hay when mixed with other grasses, especially the tall Fescue. The Blue grass (*Poa compressa*) is also cultivated, and often mixed with the meadow grass. The Blue grass is better adapted for dry sandy soil than the former, and by its creeping roots would be valuable especially on the prairies of Arkansas.

² Nuttall says that this species is allied to *Poa reptans*, and thus would go with the next genus. Probably the former also.

³ Two species of Fescues. *Festuca elatior*, the tall Fescue, and *Festuca pratensis*, Hurd., the Meadow Fescue, scarcely distinguishable in their form, are generally cultivated for hay. A rich, friable, wet soil is the best for these species.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Uniola</i> , L., . . .	Spike grass.		
* <i>U. multiflora</i> , Nutt.,		Sand,	Banks of Arkansas River.
* <i>U. gracilis</i> , Mich.,		Sandy,	Prairies.
<i>Phragmites</i> , Trin.,	Reed.		
<i>P. communis</i> , Pur.,			Wet prairies (rare).
<i>Arundinaria</i> , Mich.,	Cane.		
<i>A. macrosperma</i> , Mich.,		Alluvial,	Rich banks. Bottoms.
* <i>A. pumila</i> , Nutt.,			Red River.
<i>Lepturus</i> , R. Br.			
<i>L. paniculatus</i> , Nutt.,			Open ground.
<i>Hordeum</i> , L.,	Barley.		
<i>H. pusillum</i> , Nutt.,			Saline soil.
<i>Elymus</i> , L.,	Lyme grass.		
<i>E. Virginicus</i> , L.,		Limestone,	Barrens & banks of rivers.
* <i>E. Canadensis</i> , L.,			Nutt. Cat.
<i>Uralespis</i> , Nutt.			
* <i>U. aristulata</i> , Nutt.,		Sand,	Banks of Arkansas.
<i>Danthonia</i> , D C,	Wild Oat grass.		
* <i>D. spicata</i> , Beau.,		Limestone,	Rocky places.
<i>Phalaris</i> , L.,	Canary grass.		
* <i>P. occidentalis</i> , Nutt.,			Inundated prairies.
<i>Chloris</i> , Sw.			
* <i>C. verticillata</i> , Nutt.,		Sand,	Banks. Fort Smith.
<i>Paspalum</i> , L.			
* <i>P. purpureum</i> , Ell.,			Nutt. Cat.
* <i>P. racemosum</i> , Nutt.,			Red River. Plains.
* <i>P. stoloniferum</i> , Nutt.,			Arkansas. (Nutt. Cat.)
<i>P. setaceum</i> , Mich.,		Sandy,	Fields.
<i>P. læve</i> , Mich.,		"	Moist grounds.
<i>Panicum</i> , L.,	Panic grass.		
* <i>P. gibbum</i> , Ell.,			Swamps.
<i>P. hians</i> , Ell.,		Sand,	Low ground.
* <i>P. sanguinale</i> , L.,	Common crab-grass,		Waste grounds.
<i>P. anceps</i> , Mich.,		Sandstone,	Barrens.
* <i>P. agrostoides</i> , Spreng.,			Wet meadows.
* <i>P. capillare</i> , L.,		Sandy,	Plains.
* <i>P. virgatum</i> , L.,			Moist soil.
<i>P. clandestinum</i> , L.,		Limestone,	Woody banks.
* <i>P. microcarpum</i> , Muhl.,			Thickets.
* <i>P. pauciflorum</i> , Ell,			Wet meadows.
* <i>P. dichotomum</i> , L.,			Common.
* <i>P. verrucosum</i> , Muhl.,			Swamps.
* <i>P. ignoratum</i> , Kunth.,			Nutt. Cat.
<i>P. Crus-galli</i> , L.,	Barn-yard grass,		Waste places.
<i>Setaria</i> , Beauv., ¹	Fox-tail grass.		
<i>S. glauca</i> , Beauv.,	Bottle grass,	Sandy,	Open places. Everywhere.

¹ The Bengal grass (*Setaria Italica*, L.), and the Hungarian grass (*Setaria Germanica*, Var.), are cultivated everywhere for hay. They may do well on the drained prairies of Arkansas. Still, on the same land, oats and barley are more valuable.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG' L STATION.	NATURAL HABITAT.
<i>Orthopogon</i> , R. Br.			
* <i>O. parvifolius</i> , Nutt.,			Nutt. Cat.
<i>Cenchrus</i> , L.,	Burr grass.		
* <i>C. tribuloides</i> , L.,			Sandy banks.
<i>Rottboellia</i> , R. Br.			
* <i>R. campestris</i> , Nutt.,			Plains of Red River.
<i>Tripsacum</i> , L.,	Gama grass.		
* <i>T. dactyloides</i> , L.,			Moist soil.
<i>Erianthus</i> , Mich.,	Yellow Beard grass.		
* <i>E. alopecuroides</i> , Ell.,		Sandstone,	Barrens.
<i>Andropogon</i> , L.,	Beard grass.		
<i>A. furcatus</i> , Muhl.,			Dry prairies.
<i>A. scoparius</i> , Mich.,			" "
<i>A. Virginicus</i> , L.,		Sand and clay,	" "
* <i>A. macrourus</i> , Mich.,		"	Low ground.
* <i>A. filiforme</i> , Nutt.,			Shrubby plains.
* <i>A. ambiguum</i> , Mich.,			Open woods. Cadron R.
<i>Sorghum</i> , Pers.,	Broom Corn.		
<i>S. nutans</i> , Gray, ¹		Sandy,	Dry prairies.

Equisetaceæ. Horsetail Family.

<i>Equisetum</i> , L.,	Horsetail.		
<i>E. hyemale</i> , L., ²		Sand,	Banks of the rivers.

Filices. Ferns.

<i>Polypodium</i> , L.			
<i>P. vulgare</i> , L.,		Sandstone,	Shady rocks.
<i>P. incanum</i> , Willd.,			On trees and rocks.
<i>Allosorus</i> , Bern.,	Rock brake.		
<i>A. atropurpureus</i> , Gray,		Limestone,	Rocks.
<i>Pteris</i> , L.,	Brake.		
<i>P. aquilina</i> , L.,			Rocky hills and prairies.
<i>Adiantum</i> , L.,	Maiden hair.		
<i>A. pedatum</i> , L.,			Shaded rocks. Rich woods.
<i>A. capillus-Veneris</i> , L.,		Limestone,	Rocks near springs.
<i>Cheilanthes</i> , Swartz,	Lop fern.		
<i>C. vestita</i> , Willd.,		Sand,	Rocks.
<i>C. tomentosa</i> , Link.,		"	Rocky ridges.
<i>C. Alabamensis</i> , Kuntz.,		Limestone,	Hot springs.
<i>Woodwardia</i> , Smith.			
* <i>W. Virginica</i> , Willd.,			Swamps.
<i>Camptosorus</i> , Link.,	Walking leaf.		
<i>C. rhizophyllum</i> , Link.,			Shaded mossy rocks.

¹ So hard and siliceous is this species, and also the Beard-grass species, that their culms are not destroyed by the fires of the prairies

² Used for scouring.

LATIN NAMES.	ENGLISH NAMES.	GEOLOG'L STATION.	NATURAL HABITAT.
<i>Asplenium</i> , L., . . .	Spleenwort.		
<i>A. pinnatifidum</i> , Nutt.,		Limestone,	Cliffs.
<i>A. Ruta-muraria</i> , L.,		"	"
<i>A. Trichomanes</i> , L., . . . . .		. . . . .	Shaded cliffs.
<i>A. ebeneum</i> , Ait.,		Sandstone,	Rocky woods.
* <i>A. angustifolium</i> , Mich., . . . . .		. . . . .	Rich woods.
* <i>A. Filix-foemina</i> , R. Br., . . . . .		. . . . .	Moist woods.
<i>Woodsia</i> , R. Br.			
? <i>W. obtusa</i> , T., ¹		Limestone,	Cliffs.
<i>Cystopteris</i> , Bernh.,	Bladder fern.		
<i>C. fragilis</i> , Bernh.,		Sandstone,	Shady rocks.
<i>Aspidium</i> , Swartz,	Wood fern.		
<i>A. Thelypteris</i> , Sw., . . . . .		. . . . .	Marshes.
<i>A. spinulosum</i> , Sw., . . . . .		. . . . .	Woods.
<i>A. cristatum</i> , Sw., . . . . .		. . . . .	Swamps and woods.
* <i>A. marginale</i> , Sw., . . . . .		. . . . .	Hillsides. Rocky woods.
* <i>A. acrostichoides</i> , Sw., . . . . .		. . . . .	"
<i>Onoclea</i> , L.			
? <i>O. sensibilis</i> ,	Sensitive fern.	. . . . .	Wet shady places.
<i>Osmunda</i> , L.,	Flowering fern.		
<i>O. spectabilis</i> , Willd., . . . . .		. . . . .	Marshy woods.
* <i>O. cinnamomea</i> , L., . . . . .		. . . . .	Springs near banks of [Arkansas River.
<i>Botrychium</i> , Sw.,	Moonwort.		
* <i>B. lunarioides</i> , Sw.,		Alluvial,	Deep rich woods.
* <i>B. obliquum</i> , Muhl.,		"	" "
? <i>B. Virginicum</i> , Sw.,		"	" "
<i>Ophioglossum</i> , L.			
* <i>O. vulgatum</i> , L., . . . . .		. . . . .	Wet woods. Rich soil.

Lycopodiaceæ. Club Moss Family.

<i>Selaginella</i> , Beauv.			
<i>S. apus</i> , Sp.,		Sandy & clayish,	Wet ground.
<i>S. rupestris</i> , Spring,		Sandstone,	Dry rocky places.
<i>Azolla</i> , Lam.			
* <i>A. Caroliniana</i> , Willd., . . . . .		. . . . .	Floating. Pools.
<i>Marsilea</i> , L.			
* <i>M. mucronata</i> , Willd., . . . . .		. . . . .	" "

¹ I have seen it in the southern part of Illinois on the Mississippi River, but not in Arkansas.



CRETACEOUS FOSSILS
OF
ARKANSAS.

PLATE I.



Fig. 1. *Trorriamus* sp. undt. Fig. 2. *Cardium*. Fig. 3^a, 3^b. *Ostrea ovata*, Morton. Fig. 4. *Exogyra costata*, Say. Fig. 5. *Ostrea sulcata*, Morton. Fig. 6. *Gryphus Pitcheri*, Morton. Fig. 7. *Ostrea crassa*, Morton.



CRETACEOUS FOSSILS OF
OF
ARKANSAS



Fig. 1. *Corbula* sp. unat. Fig. 2. *Turritas* sp. unat. Fig. 3. *Urosalpinx* sp. unat.
Fig. 4. *Pisus* sp. unat. Fig. 5. *Crassatella* sp. unat. Fig. 6. *Urosalpinx* sp. unat.
Fig. 7. *Urosalpinx* sp. unat. Fig. 8. *Urosalpinx* sp. unat. Fig. 9. *Urosalpinx* sp. unat.



TERTIARY FOSSILS
OF
ARKANSAS.

EOCENE.

PLATE IV

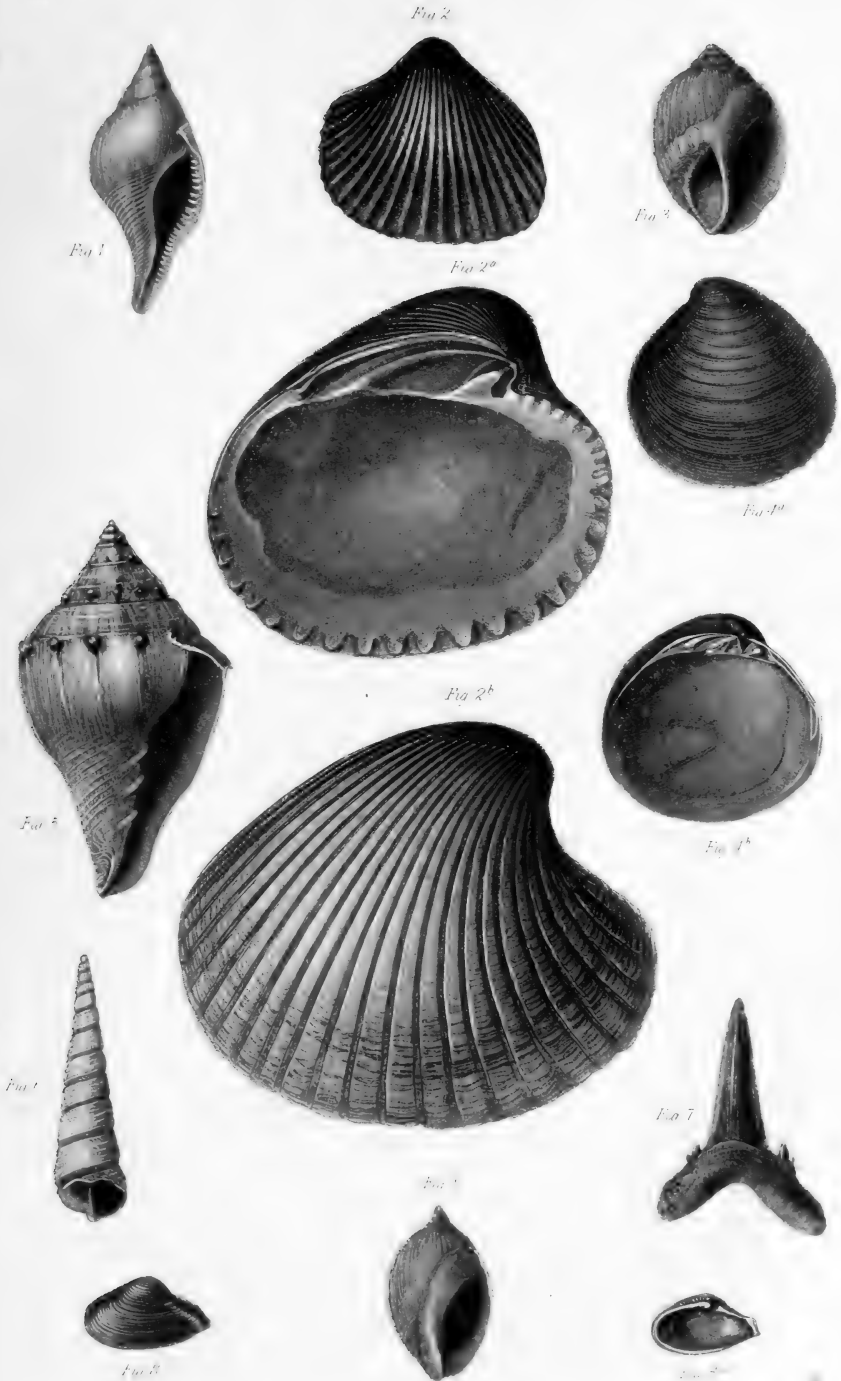


Fig. 1. *Fusus*. Fig. 2. 2^a, 2^b. *Venurcantiella planicosta*, Lam. Fig. 3. *Montereyus costatus*, Lea. Fig. 4^a, 4^b. *Cytherea* sp. undt. Fig. 5. *Voluta* sp. undt. Fig. 6. *Turritella picea*, Say. Fig. 7. *Lamna* sp. undt. Fig. 8. *Cerbulina subulobosa*, Lea.





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